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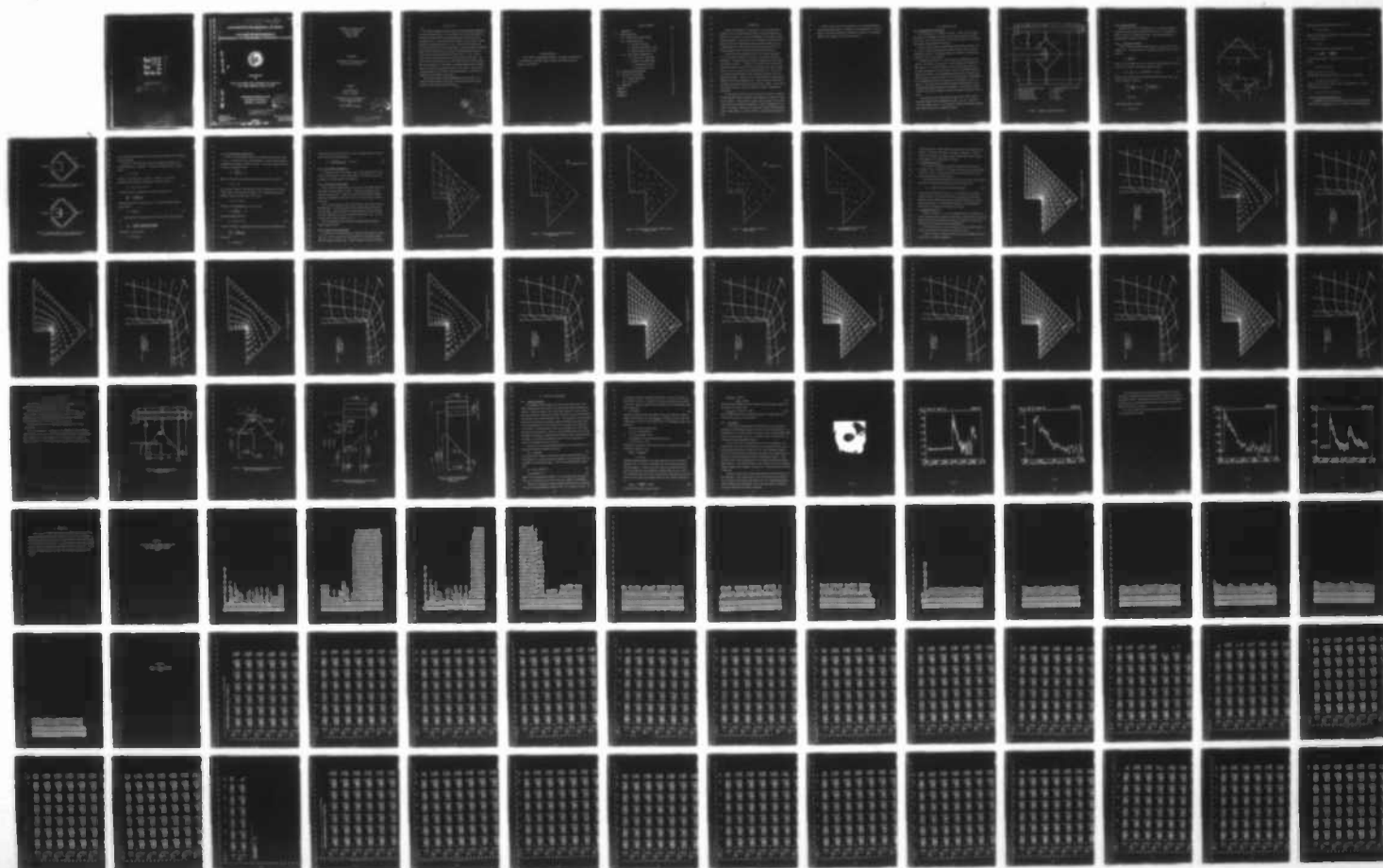
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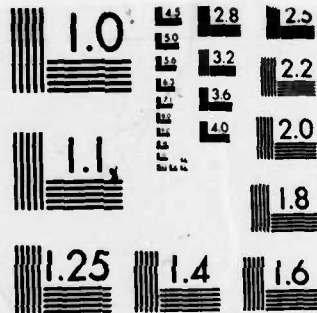
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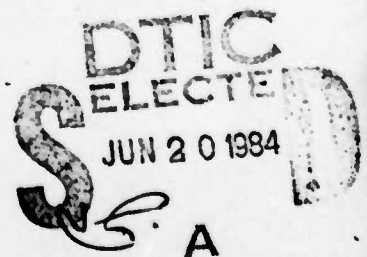
COLLEGE OF ENGINEERING  
ENGINEERING AND INDUSTRIAL EXPERIMENT STATION



FINAL REPORT  
ON

DEVELOPMENT OF A DISTRIBUTED BREACH  
FOR THE CONICAL SHOCK TUBE

PRINCIPAL INVESTIGATORS  
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January, 1983

Final Report  
on  
Development of a Distributed Breach  
for the Conical Shock Tube

Submitted  
by  
Sayed M. Metwalli  
Faissal A. Moslehy

In Accordance with the Requirements of  
Contract N00014-82-K-2049  
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## A B S T R A C T

This report represents the final stage of distributed breach development for the conical shock tube. An initial design of the distributed breach has been used to find the effect of prestressing before firing on the stress state after firing. Finite element method has been used to evaluate in-plane and hoop stresses before and after firing. A coarse finite element model is used to find points of high stresses before a finer mesh thereat is adopted. Results confirm the existence of a prestress three dimensional continuum which creates a very high resistance to firing loads. In fact, stresses have literally been improved after firing due to prestressing effect. The results of the initial design led to modifications which can further improve the stress distribution in the breach. The improved design with its working drawing is included in the redesign section of this report. The next stage is the manufacturing and testing of the improved design. This will be included in this final report of the project.

Test results indicate a marked improvement over the old tube. No failure has occurred and the efficiency of simulating real blasts is about 90% which is much higher than the old tube.

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#### ACKNOWLEDGEMENTS

We would like to acknowledge the efforts, the support, and the help of Dr. Lee Van Buren, Lynn Poche, Robert Carnegie, William Barrow, David Mitchell, and Sam Petrie.

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## I. INTRODUCTION

A program of development and redesign of the existing shock tube is presented. One of the main problems which has limited the continued successful use of the tube is the plastic deformation in the breach resulting from the detonation. The objectives of this proposed continuation of the current program is to develop a new design to the shock tube with a distributed breach which should enhance shock wave characteristics by minimizing the energy losses associated with the plastic deformation.

An explosive driven hydrodynamic conical shock tube was developed [1, 2, 3] to test the integrity of a device in an explosive underwater environment. The original design utilized an expendable mild steel breach to confine the explosive. The number of shots which could be made before replacing the breach plug varied from a large number when using a blasting cap only to one or two when using 10 grams equivalent TNT. Also the loss of energy through the resulting plastic deformation severely limits the amplification factor - reducing it from 7770 theoretically to approximately 1400 when using 10 grams equivalent TNT. The shock tube was fabricated in two pieces of approximately four feet and six feet in length. This was done to facilitate handling of the tube, whose total weight is approximately 1200 pounds.

In this interim report the four foot section of the tube is discarded and the equivalent amount of charge is distributed over a spherical surface at that station. Current results of dynamic history response of the shorter shock tube [3] has indicated no degradation in natural frequencies or mode shapes. The dynamic stress wave in the tube wall indicated tolerable magnitudes. Stress analysis is herein initiated to investigate the proposed design.

To get a closer insight into the stresses in the distributed breach, a simple and approximate model is selected for the expendable part. After the analysis is completed accordingly a redesign of the breach is consumated depending on the findings of the preliminary analysis.

## II. DESIGN CALCULATION

### II-1. Description of Initial Design

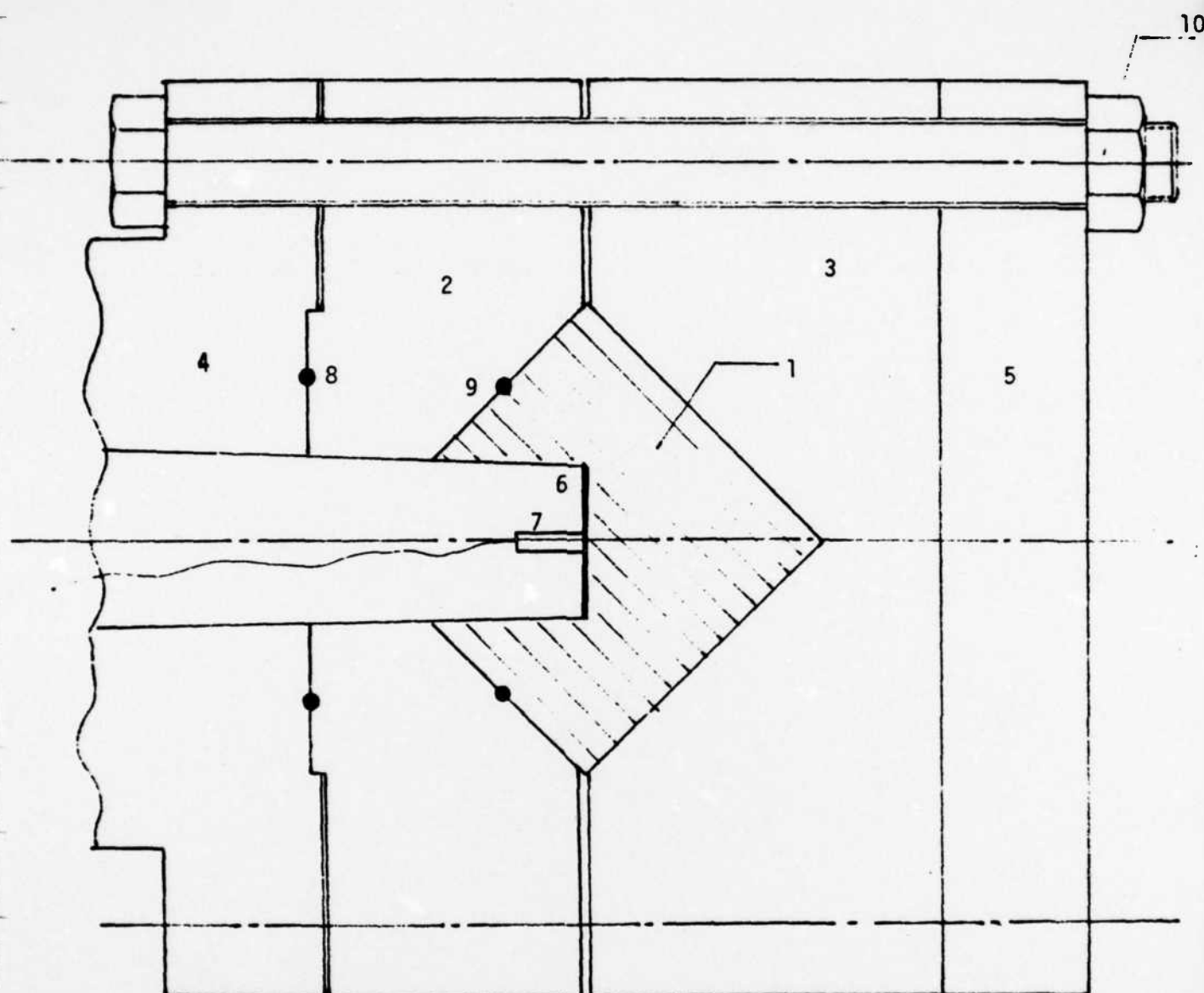
The initial design is illustrated in Figure 1. Again, use of an expendable section is recommended to prevent the occurrence of damage to the body of the tube. Use of this piece will also permit the insertion of an isolation layer between the breach and the tube body.

This new design provides a prestressed three dimensional continuum, part (1), Figure 1, around the detonation area which creates a triaxial state of hydrostatic stress [4]. The proposed design has, therefore, considerable advantages over the existing design.

A spherical wave front of 4' radius should exist immediately after detonation. Initiation will be by use of a single blasting cap located at the tube centerline. The rate of detonation will be approximately 20,000 fps. The rate of propagation of the shock wave in water is approximately 5000 fps. Therefore the surface of the distributed charge should not be spherical, but should actually be concave by almost 1/4" at the tube centerline (5000/20000). It is recommended that the initial feasibility be determined, using a flat surface. This would allow use of DuPont Line Wave Generator which is a perforated flexible explosive prepared from Datasheet. Its thickness of 0.050" is almost exactly what is needed to provide the desired total amount of explosive.

The available finite element computer program (SAP IV) [5] is used in the stress analysis of the expendable part (part 1, fig. 1). To perform the finite element analysis it is necessary to identify the boundary conditions and to define type, form, and number of element.





- |                                   |                                    |
|-----------------------------------|------------------------------------|
| 1. Double cone expendable section | 6. Line Wave Generator (Detaprime) |
| 2. Steel backing jaws             | 7. Blasting Cap                    |
| 3. Steel backing jaws             | 8. O-ring                          |
| 4. Existing Shock Tube            | 9. O-ring                          |
| 5. Existing Back Up Plate         | 10. Long Bolt                      |

Figure 1. Schematic of Distributed Breach

## II-2. Boundary Conditions

Stiffness calculation of the expendable part is required to properly evaluate the external pressure before and after firing. The prestressing before firing will be altered after firing. The following calculations are performed to define both conditions.

### II-2. 1. Stiffness Calculation

Figure 2(a) and (b) show diagrammatic sketches of the two ends of the expendable part. The contraction  $d\delta$  of an element of length  $dx$  (Fig. 2(a)) is given by

$$d\delta = \frac{P(x)}{EA(x)} dx \quad (1)$$

where  $E$  is Young's modulus and  $A(x)$  is the area of the element  $dx$  at distance  $x$  and  $P(x)$  is the total force on the element such that

$$P(x) = \frac{P_2}{\sqrt{2}} \pi (r + a) \sqrt{(r+a)^2 + x^2} = p_2 \pi (x^2 - a^2) \quad (2)$$

where  $p$  is the normal press on the surface and the cone angle is  $45^\circ$ . The total contraction is given by

$$\begin{aligned} \delta &= \int_{x=a}^{x=h} \frac{P(x)}{EA(x)} dx = \frac{1}{E} \int_{x=a}^{x=h} \frac{P_2 \pi (x^2 - a^2)}{\pi (x^2 - a^2)} dx \\ &= \frac{P_2}{E} (h-a) \end{aligned} \quad (3)$$

The resultant force is given by

$$F = p_2 (h^2 - a^2) \pi \quad (4)$$

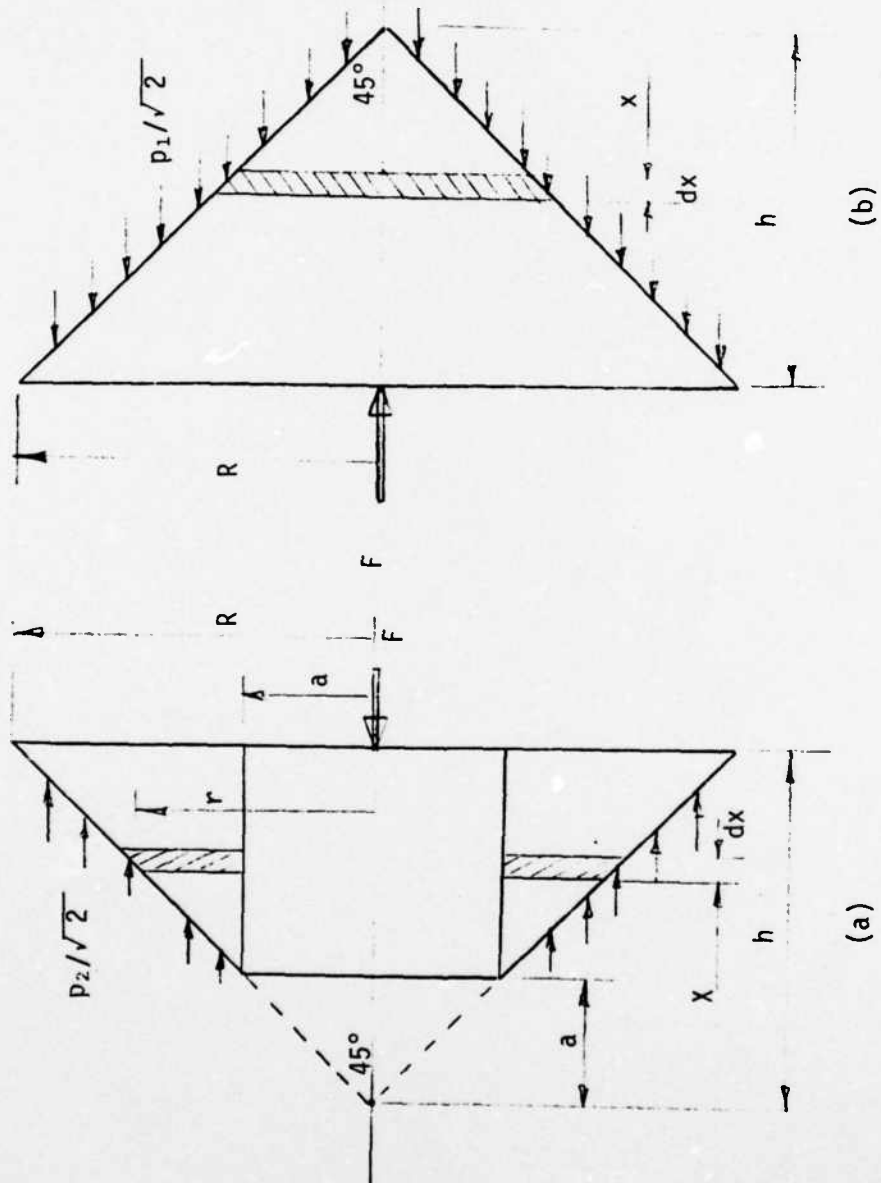


Figure 2. Diagrammatic Sketch of the Two Ends of the Expendable Part

Hence the stiffness of the part shown in fig. 2(a) is

$$k_1 = \frac{F}{\delta} = \pi E(h+a) \quad (5)$$

Similarly the stiffness of the end Fig. 2(b) can be obtained by substituting  $a = 0$  in eq. (5) to get

$$k_2 = \pi E h \quad (6)$$

The equivalent stiffness of the expendable part is then

$$k_e = \frac{k_1 k_2}{k_1 + k_2} = \frac{\pi E h (h+a)}{(2h+a)} \quad (7)$$

For the initial design  $h$  is selected as 3 in. and  $a$  as 1 in. Hence eq. (7) yields

$$k_e = 162 \times 10^6 \text{ lb/in} \quad (8)$$

where  $E = 30 \times 10^6$  psi for steel.

The stiffness of a single bolt (part 10 in fig. 1) is expressed by

$$k = \frac{EA}{\ell} = 1.06 \times 10^6 \text{ lb/in}$$

where  $\ell = 12.5$  in and  $A = 0.44 \text{ in}^2$  for 3/4 in diameter bolt. The total stiffness of the 12 bolts is

$$k_b = 12 k = 12.7 \times 10^6 \text{ lb/in} \quad (9)$$

## II. 2.2 Surface Pressure Before Firing

A diagrammatic sketch of the expendable part with the surface pressure before firing is depicted in fig. 3. To evaluate the surface pressures  $p_1$

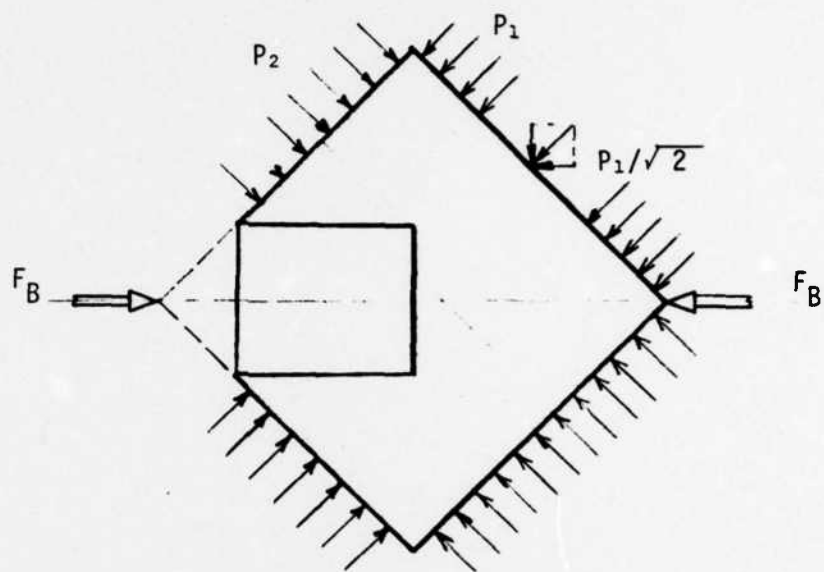


Figure 3. Diagrammatic Sketch of the Expendable Part with Surface Pressure Before Fixing

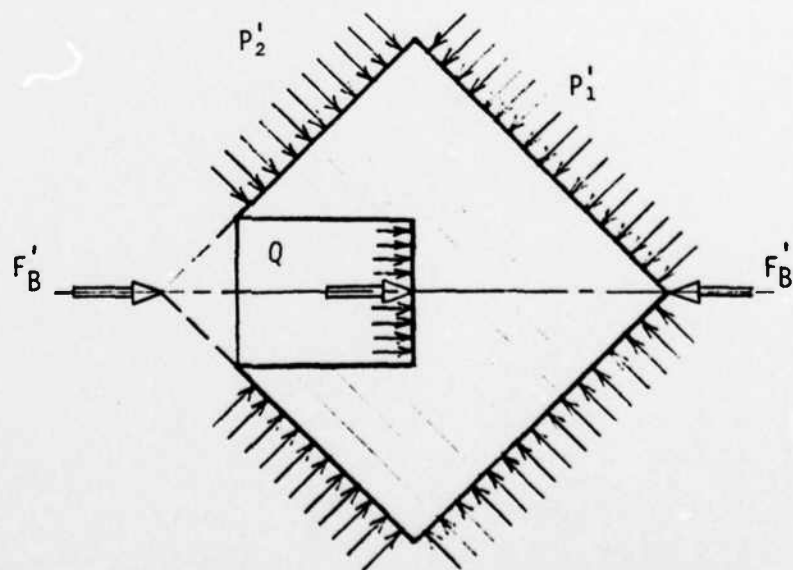


Figure 4. Diagrammatic Sketch of the Expendable Part with Surface and Detonation Pressures after Firing

and  $p_2$  the total force generated from the prestressing caused by bolt tightening should be obtained.

Using 3/4 in SAE Grade 5 bolts with proof strength  $S_p = 85,000$  psi and ultimate strength  $\sigma_u = 120,000$  psi. The initial tightening force  $F_i$  is given by [4]

$$F_i = 0.9 S_p A_t$$

where  $A_t$  is the tensile area =  $0.334 \text{ in}^2$ . Therefore  $F_i = 25,550 \text{ lb}$ .

The maximum force produced by tightening all 12 bolts is then

$$F_B = 12 F_i = 0.307 \times 10^6 \text{ lb} \quad (10)$$

The normal pressure  $p_1$  generated by this force is obtained from

$$\frac{p_1}{\sqrt{2}} = \frac{F_B}{\text{surface area}}$$

where the right conical surface area is  $\sqrt{2} \pi h^2$ . Substituting the values of  $F_B$  and  $h$  gives

$$p_1 = 10,844 \text{ psi} \quad (11)$$

From equilibrium of the whole part (Fig. (3)) the ratio  $\frac{p_2}{p_1}$  is obtained by

$$\frac{p_2}{p_1} = \frac{\text{Area of right conical surface}}{\text{Area of left conical surface}}$$

from which  $p_2$  is calculated as

$$p_2 = 12,184 \text{ psi} \quad (12)$$



### II. 2.3 Surface Pressure After Firing

After firing the expendable part will be subjected to the loads as shown in Fig. 4. To evaluate the new surface pressures  $p_1'$  and  $p_2'$  after firing the preloading effect should be taken into account. The forces in the bolts after firing  $F_B$  is obtained from [4].

$$F_B' = \frac{k_b Q}{k_b + k_e} + F_B \quad (13)$$

where  $Q$  is the total force induced by the pressure wave and is given by

$$Q = p_m \cdot \pi a^2 \quad (14)$$

$p_m$  is the peak pressure at the location of the distributed breach (at 4 feet from the apex of tube) and equals 25,000 psi [1]. Substituting the values from eqs. (8,9,10) and (14) into eq. (13) given

$$F_B' = 312 \times 10^3 \text{ lb} \quad (15)$$

The force in the expendable part is given by [4]

$$F_e = \frac{k_e Q}{k_b + k_c} - F_B \quad (16)$$

which upon substitution gives

$$F_e = -234 \times 10^3 \text{ lb} \quad (17)$$

The normal pressure  $p_1'$  generated by this compressive force is obtained from

$$\frac{p_1'}{\sqrt{2}} = \frac{F_e}{\text{surface area}}$$

which gives

$$p_1' = 8,276 \text{ psi} \quad (18)$$

From equilibrium of the whole part (Fig. (4)), the normal pressure on the left conical surface may be calculated by

$$p_2' = \frac{F_e - Q}{\text{Left surface area}} = 6,175 \text{ psi} \quad (19)$$

### II.3. Finite Element Implementation

A preliminary coarse finite element model of the expendable part is used first to find the points of high stresses where a finer mesh should be used. A refined finite element model is then adopted.

#### II.3.1 Coarse Finite Element Model

Figure 5 shows the selected mesh for the coarse finite element model with both element and node numbers indicated. The mesh was generated by using computer program GRID [6]. Twenty-five quadrilateral axisymmetric elements based on an isoparametric formulation are used. The total number of nodes is thirty-five.

SAP IV computer program [5] was used to evaluate the stresses inside the expendable part. The three principle stresses were obtained at the center of each element. Figure 6 shows the in-plane compressive principle stresses and their orientation for the case of prestressing before firing. The third principle stress (hoop) is shown in Fig. 7.

Stresses generated after firing were also computed and displayed as shown in figures 8 and 9.

#### II.3.2 Refined Finite Element Model

It can easily be seen that high stress gradients occur around the detonation area. For this reason a finer mesh generated by the computer program GRID was adopted around that area. A general computer program was developed

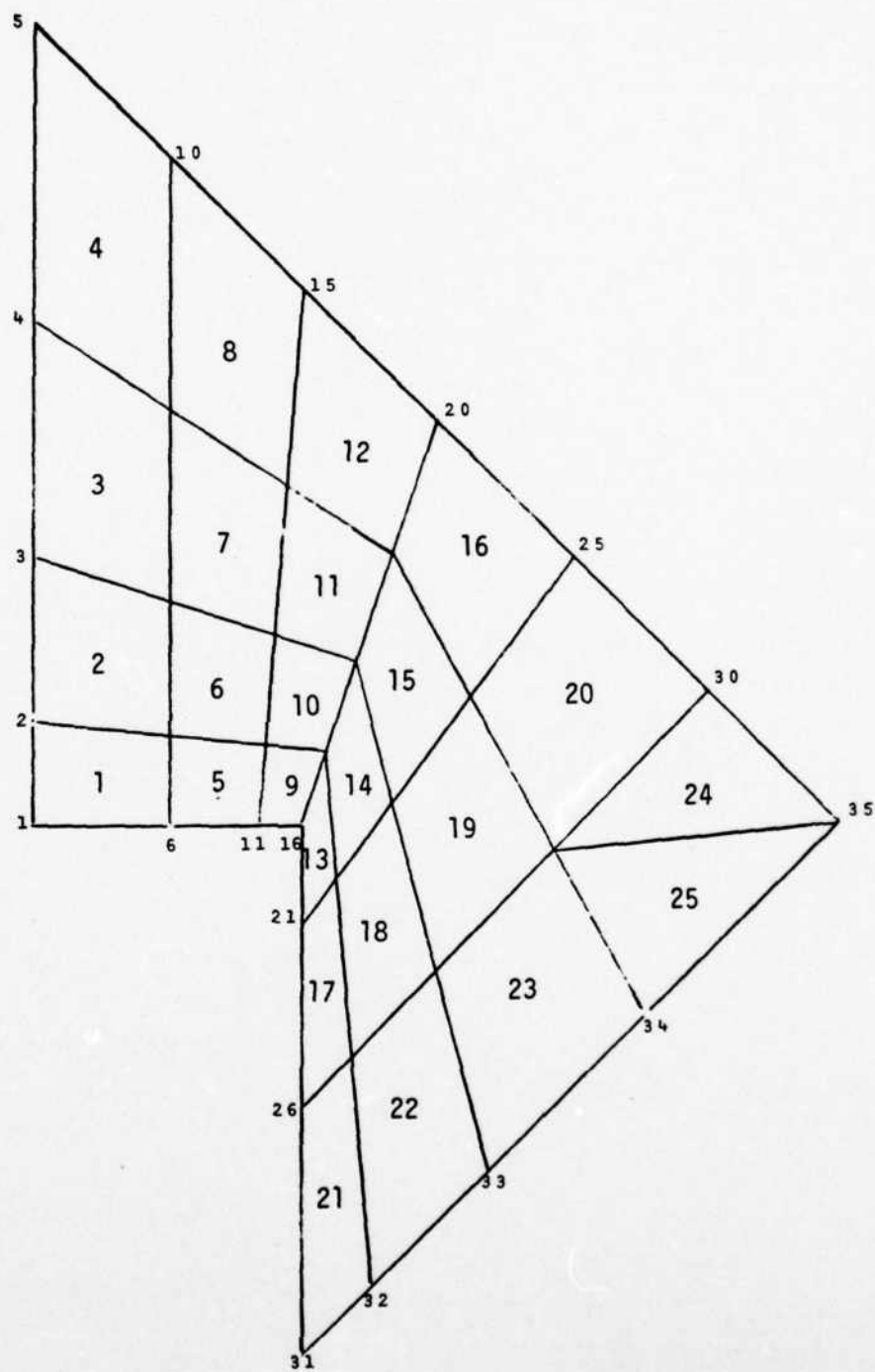


Figure 5. Coarse Finite Element Model

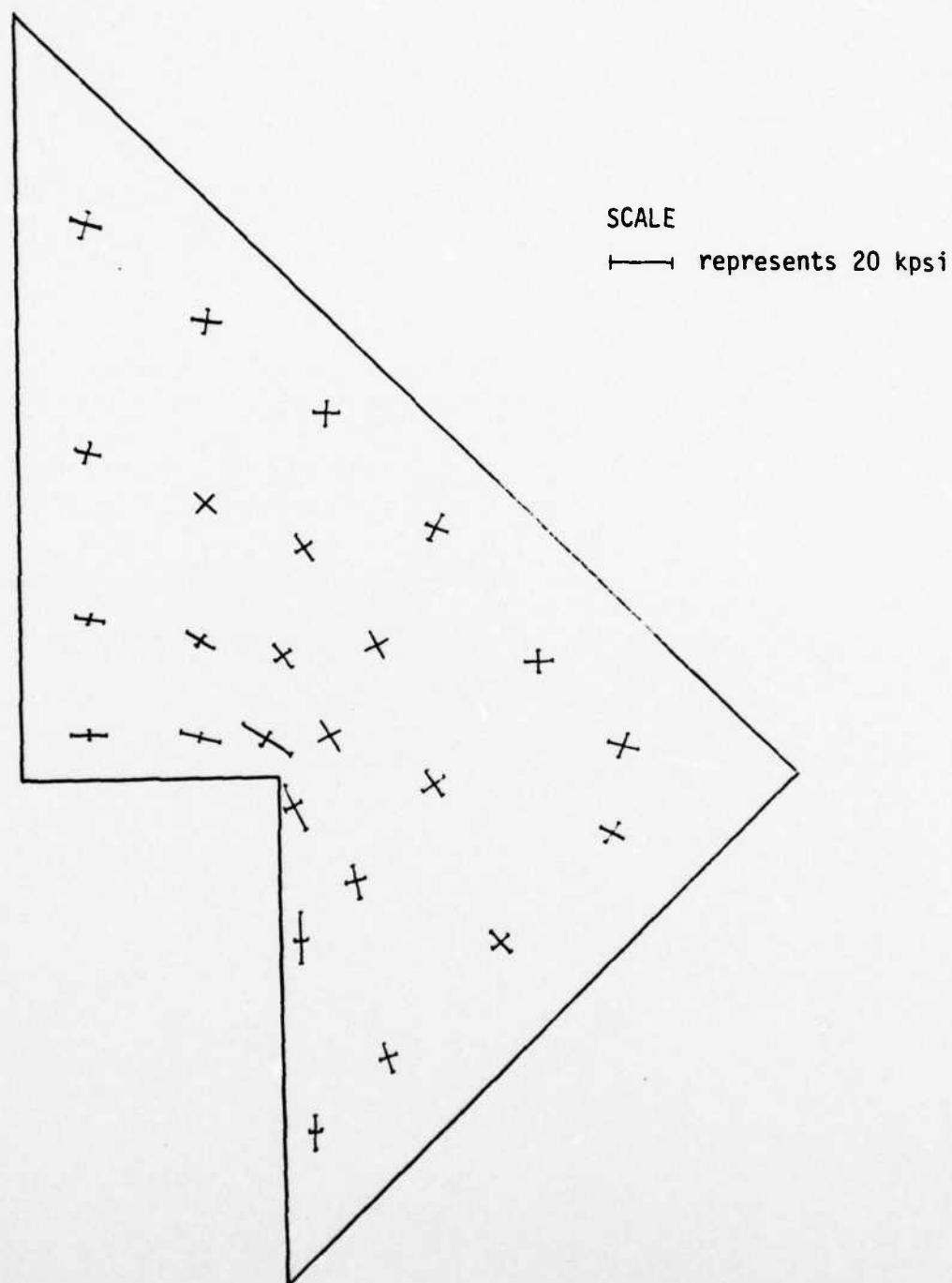


Figure 6. In-plane Compressive Principal Stresses  
Before Firing

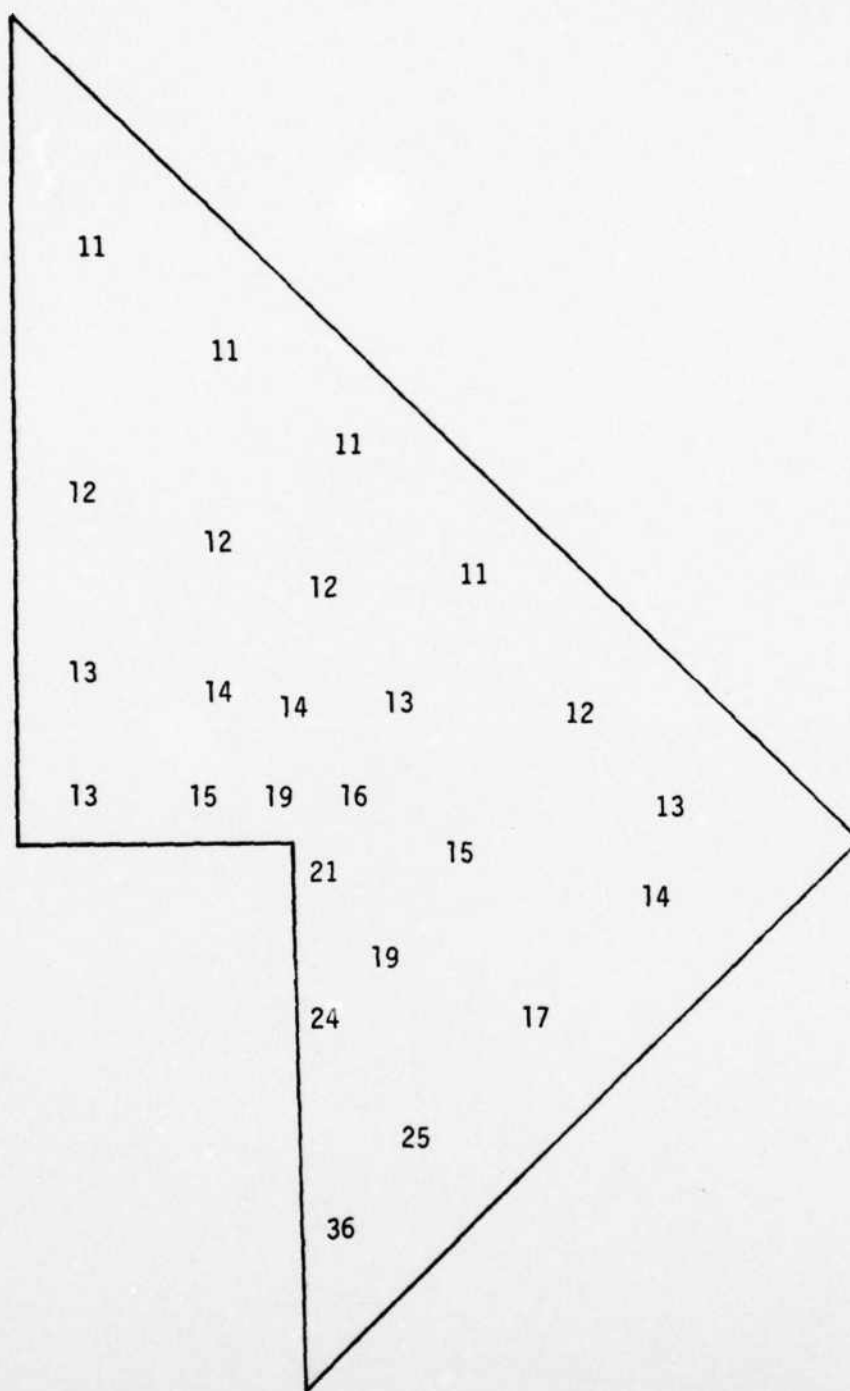


Figure 7. Third Compressive Principal (HOOP) Stresses  
Before Firing

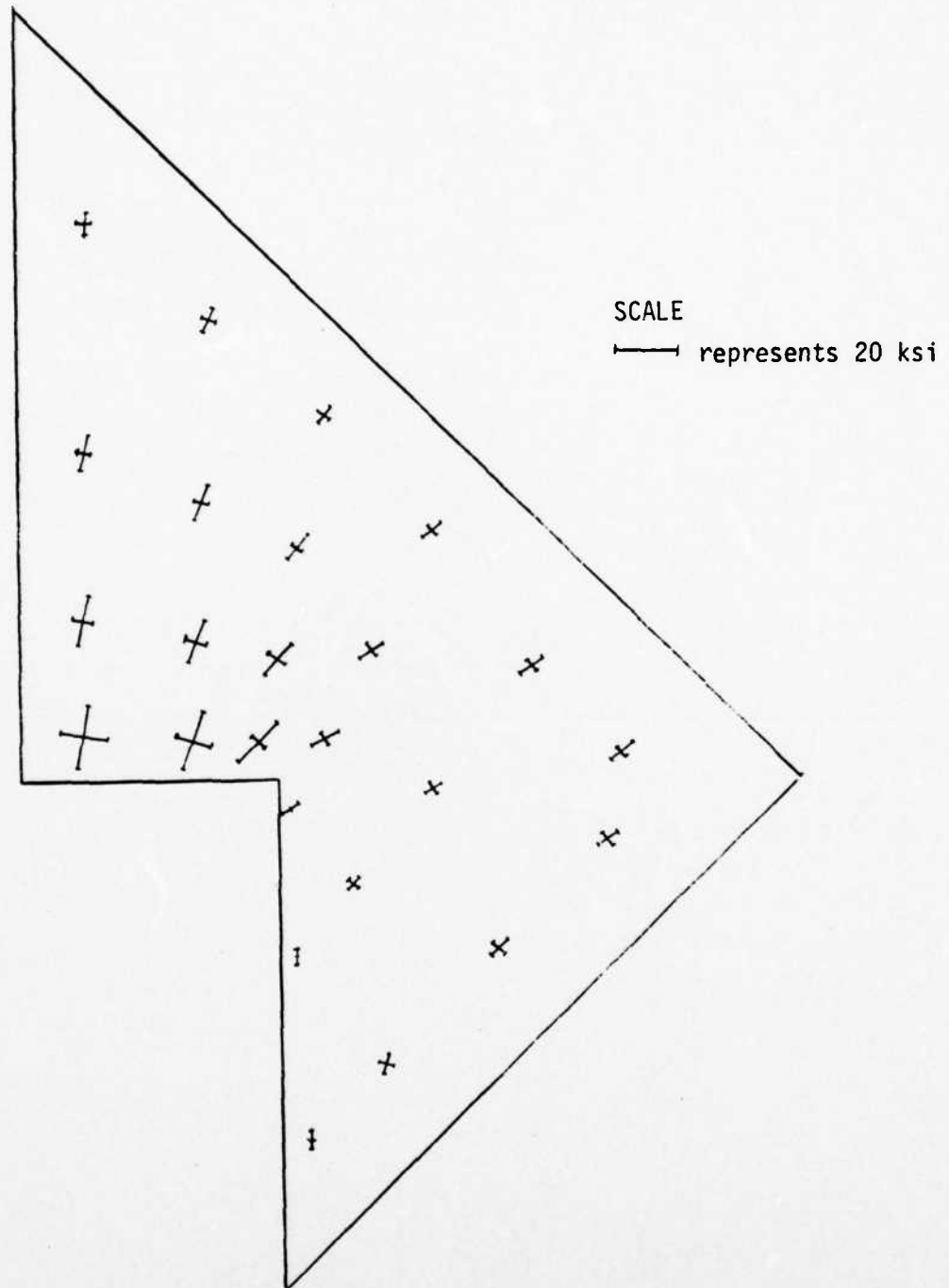


Figure 8. In-Plane Compressive Stresses  
After Firing



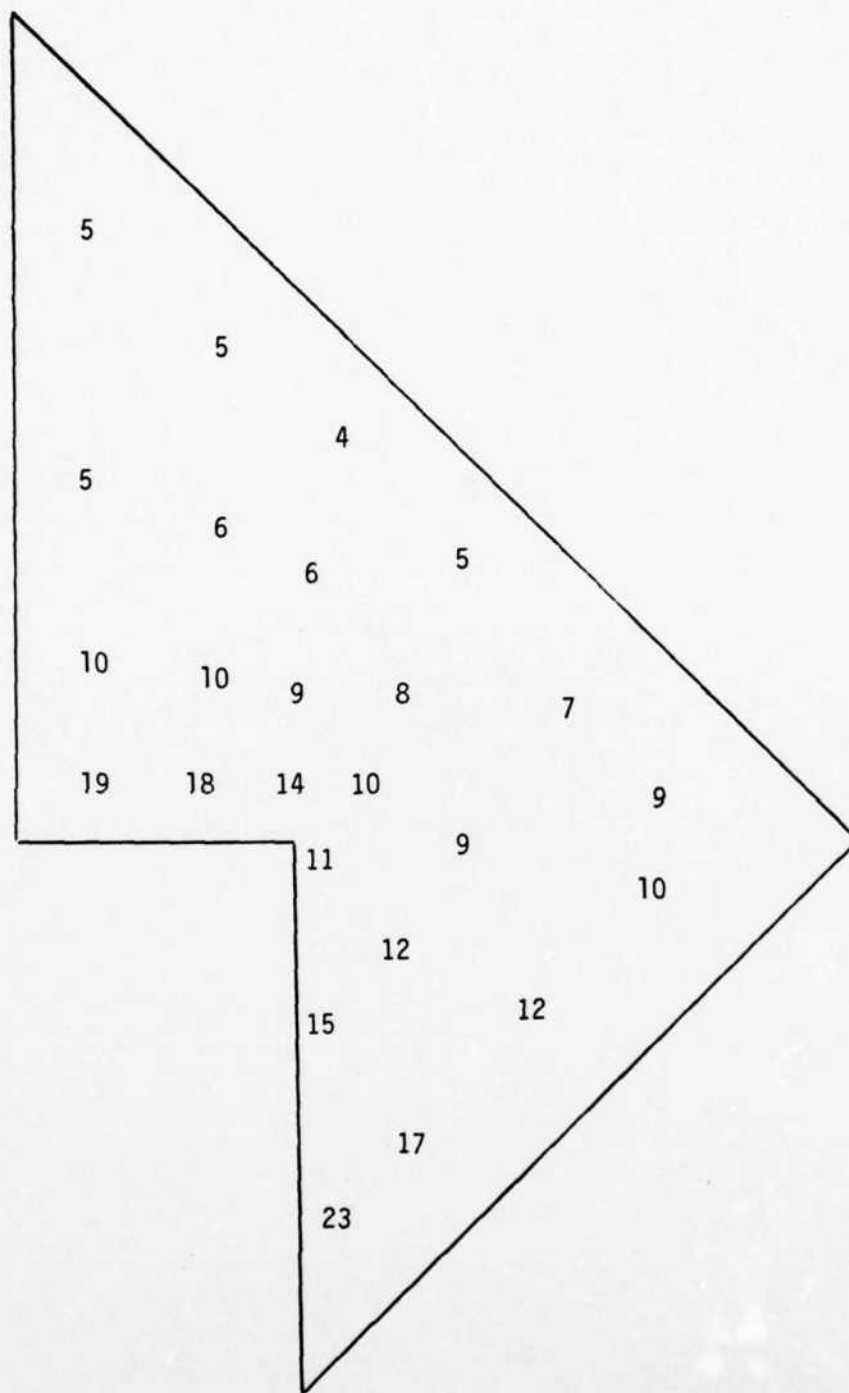


Figure 9. Third Compressive Principal (HOOP) Stresses After Firing

to display the mesh, element number, and stress values at the center of each element. A listing of the program is included in Appendix A. Figure 10 shows the refined mesh with element numbers indicated and figure 11 depicts an enlargement of the crowded part of the mesh.

#### A. Stresses before firing

The output of the computer program for the three principle stresses (in-plane  $\sigma_1$  and  $\sigma_2$  and hoop  $\sigma_3$ ) is plotted in figures 12-17 for the prestressing before firing. It should be noted that the printed positive values of stresses are compressive and vice versa.

Since the distortion energy theory of failure [4] is used in this analysis the value of the equivalent von Mises stress is calculated from

$$\sigma_e = \sqrt{\frac{1}{2}[(\sigma_1 - \sigma_2)^2 + (\sigma_2 - \sigma_3)^2 + (\sigma_3 - \sigma_1)^2]} \quad (20)$$

Figures 18 and 19 display the values of  $\sigma_e$  at the center of each element. It is obvious from fig. 18 that the value of  $\sigma_e$  is nearly zero at the outer boundary of the expendable part except at the mouth where there is no continuity of the material. This demonstrates the state of almost hydrostatic stress and the suitability of the design of this part.

#### B. Stresses after firing

Principle stresses ( $\sigma_1$ ,  $\sigma_2$ , and  $\sigma_3$ ) computed after firing including the effect of prestressing are shown in figures 20-25. Comparing values of stresses before and after firing reveals that the state of stress has literally been improved after firing due to the prestressing effect.

The von Mises stress ( $\sigma_e$ ) is also plotted in figures 26 and 27 which indicate the improvement in the state of stress after firing.

A complete listing of computer printout results for both before and after firing cases is included in Appendix B.

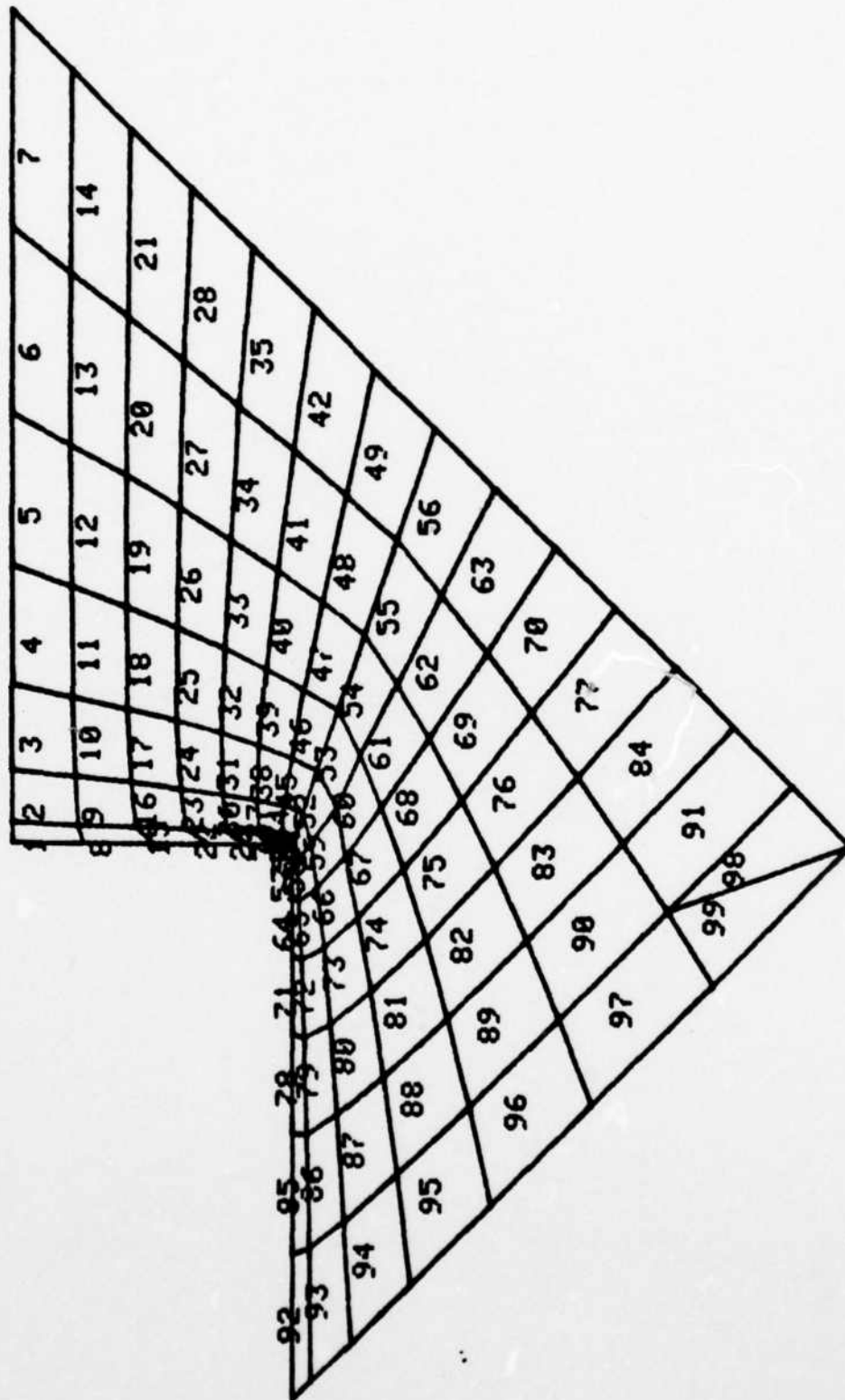
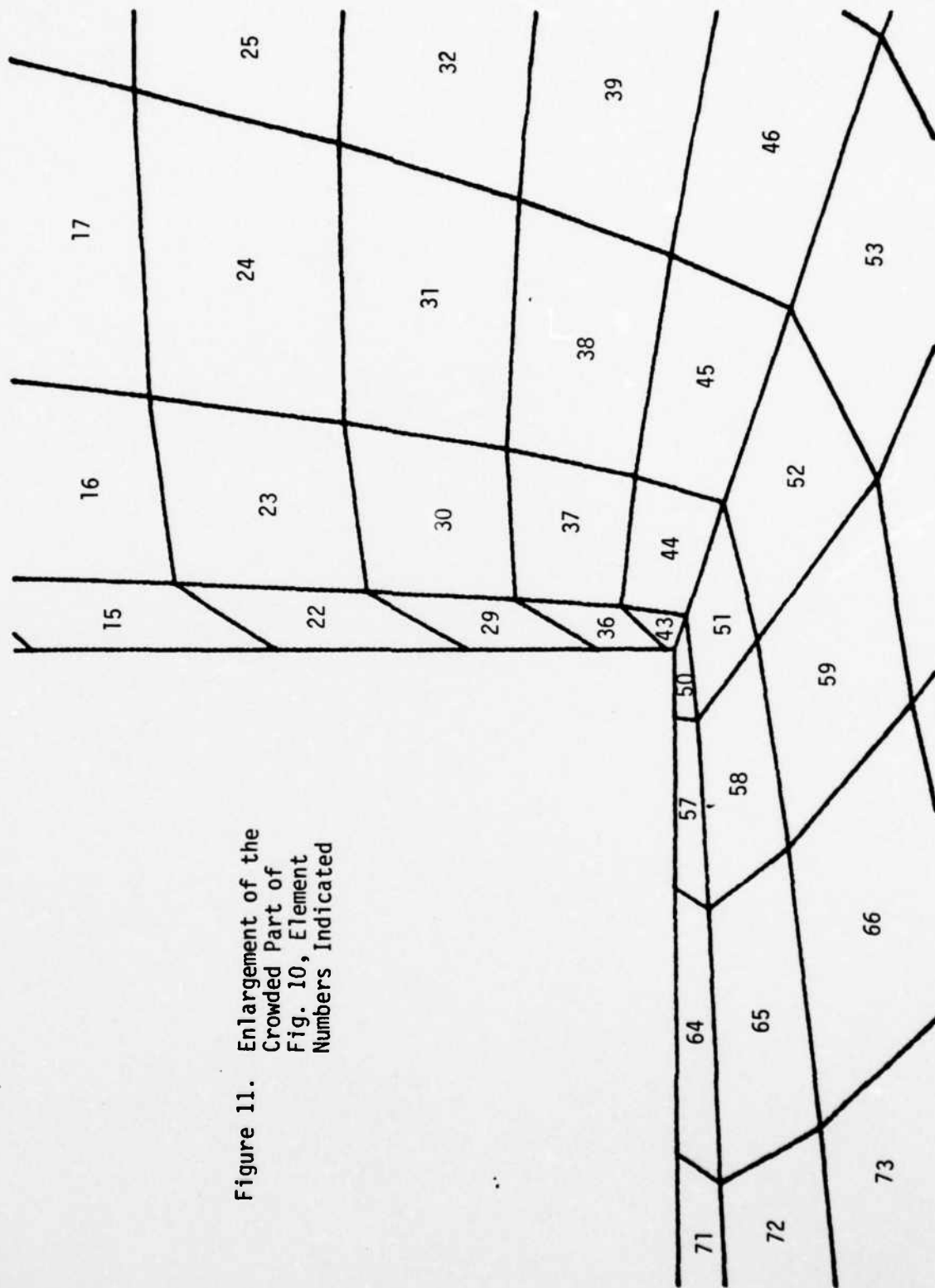


Figure 10. Refined Finite Element Mesh, Element Numbers Indicated

Figure 11. Enlargement of the  
Crowded Part of  
Fig. 10, Element  
Numbers Indicated



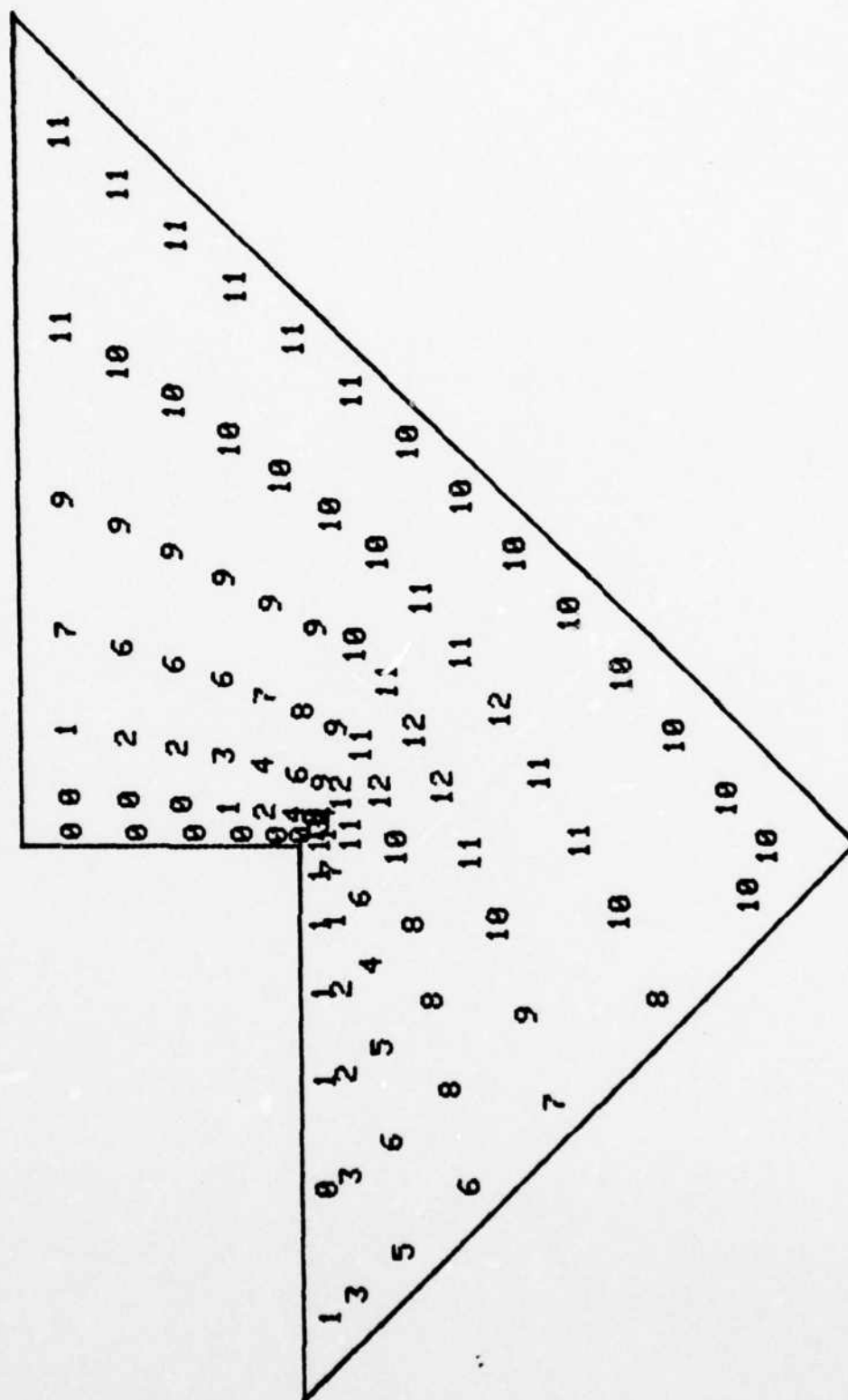
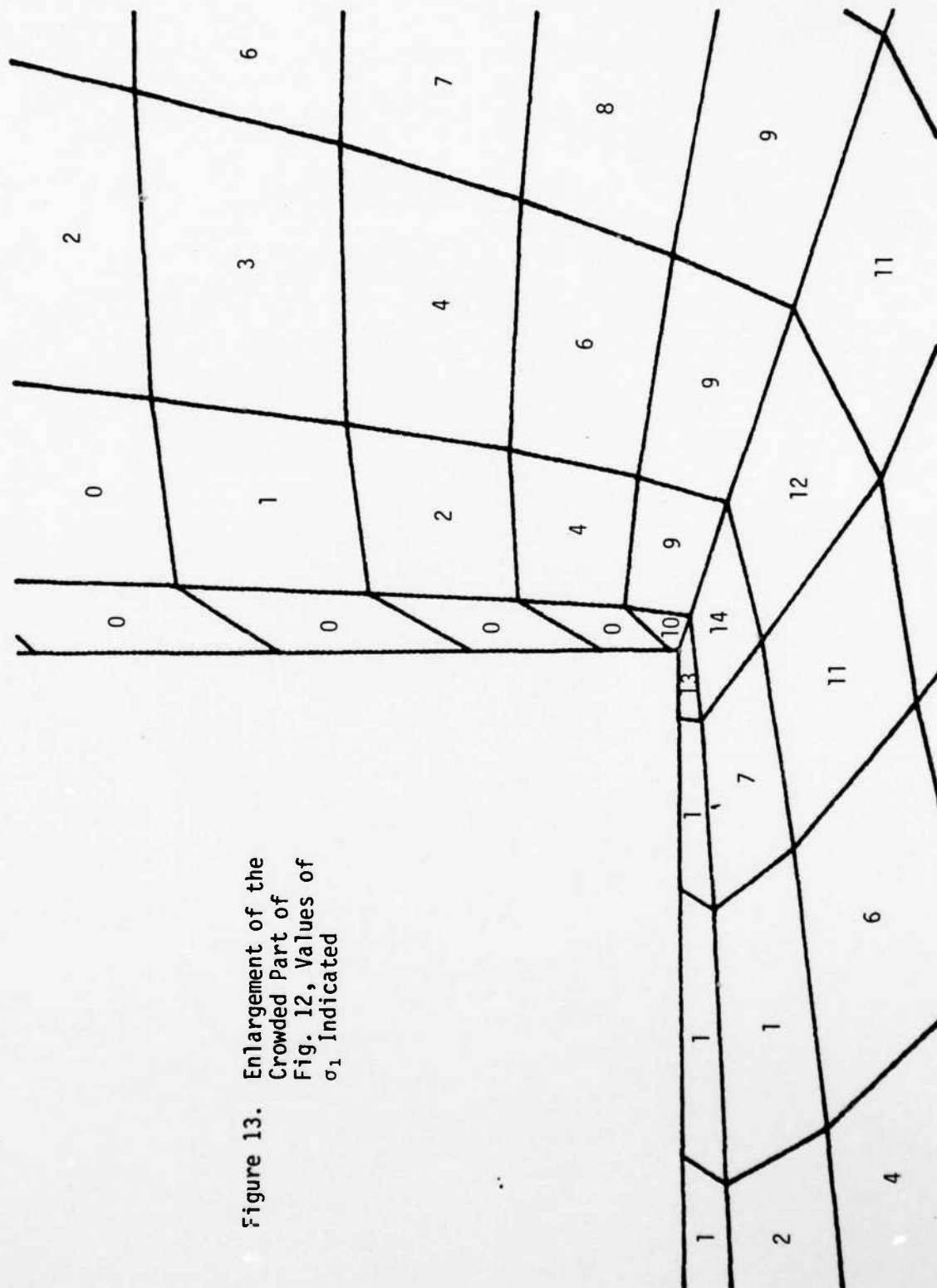


Figure 12. Compressive Principal Stress ( $\sigma_1$ ) Before Firing





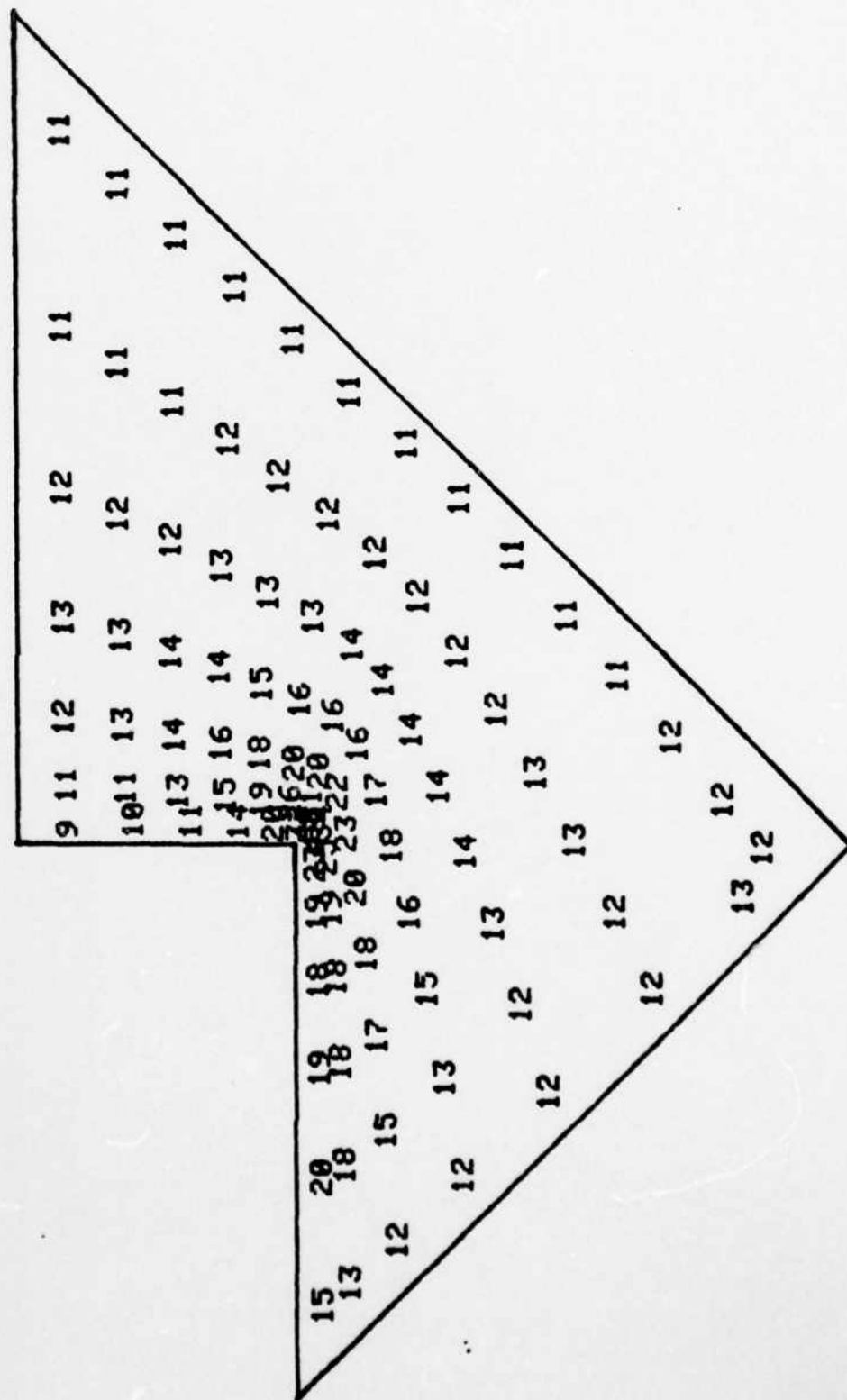


Figure 14. Compressive Principal Stress ( $\sigma_2$ )  
Before Firing

Figure 15. Enlargement of the Crowded Part of Fig. 14, Values of  $\sigma_2$  Indicated

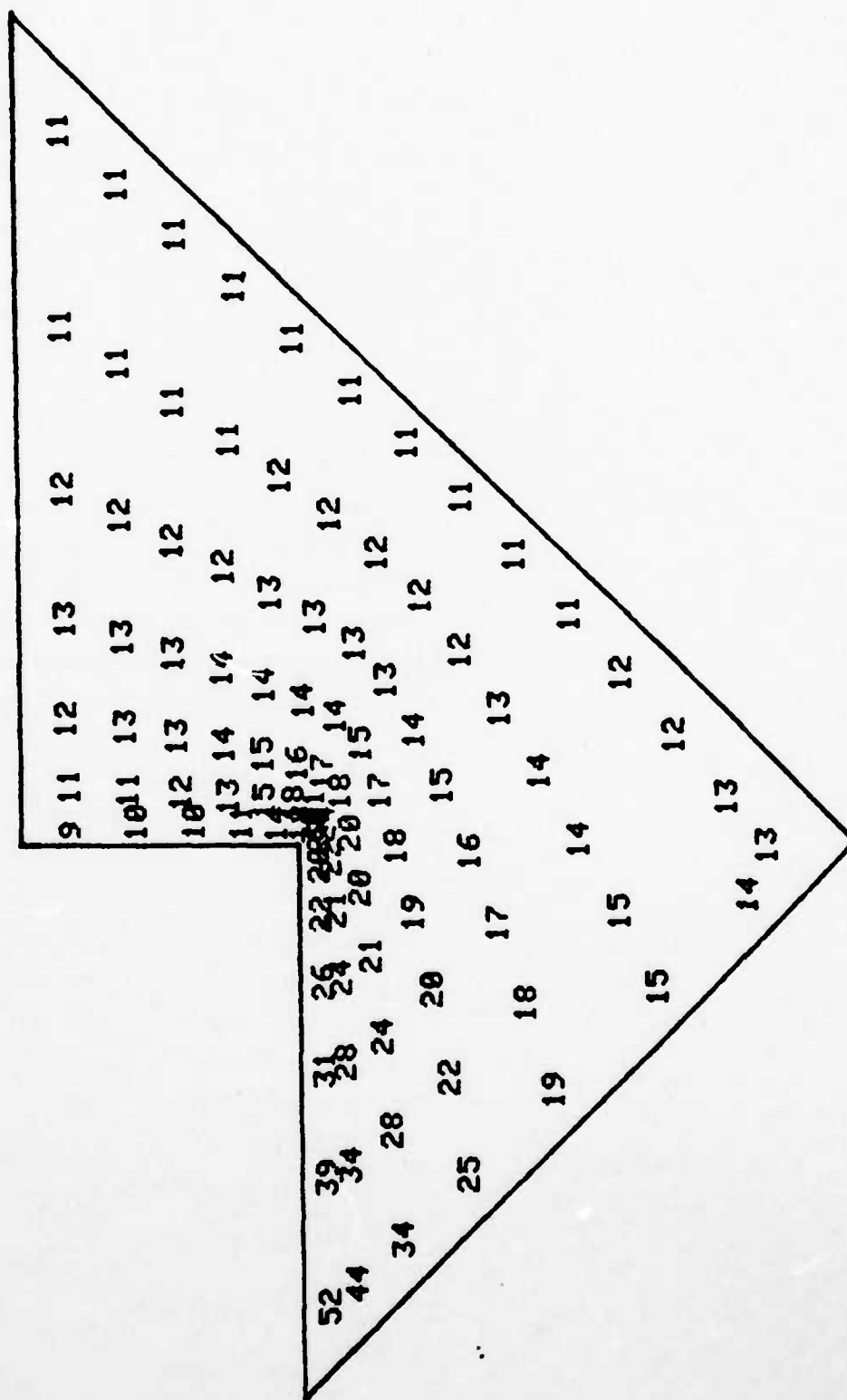
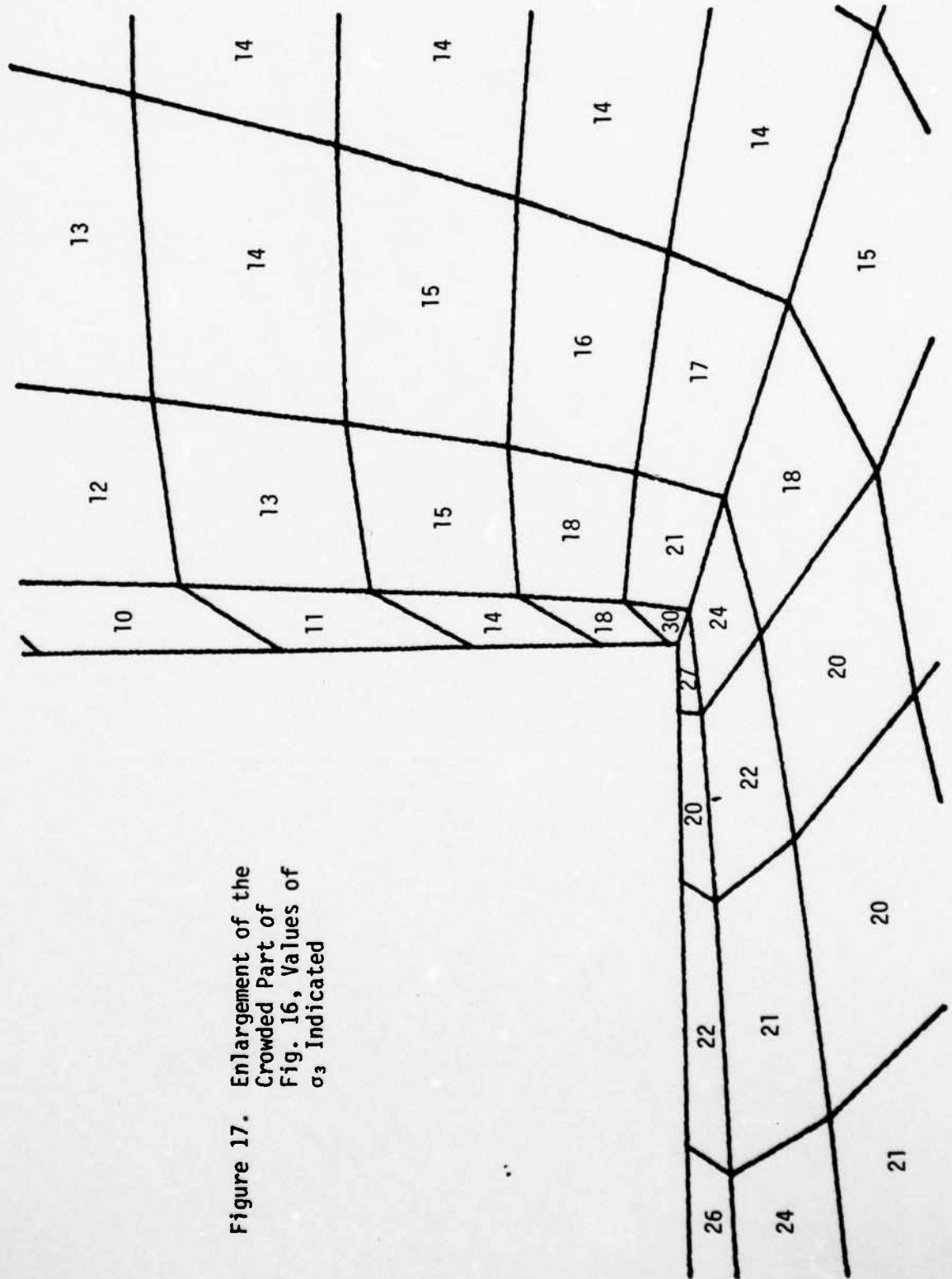


Figure 17. Enlargement of the  
Crowded Part of  
Fig. 16, Values of  
 $\sigma_3$  Indicated



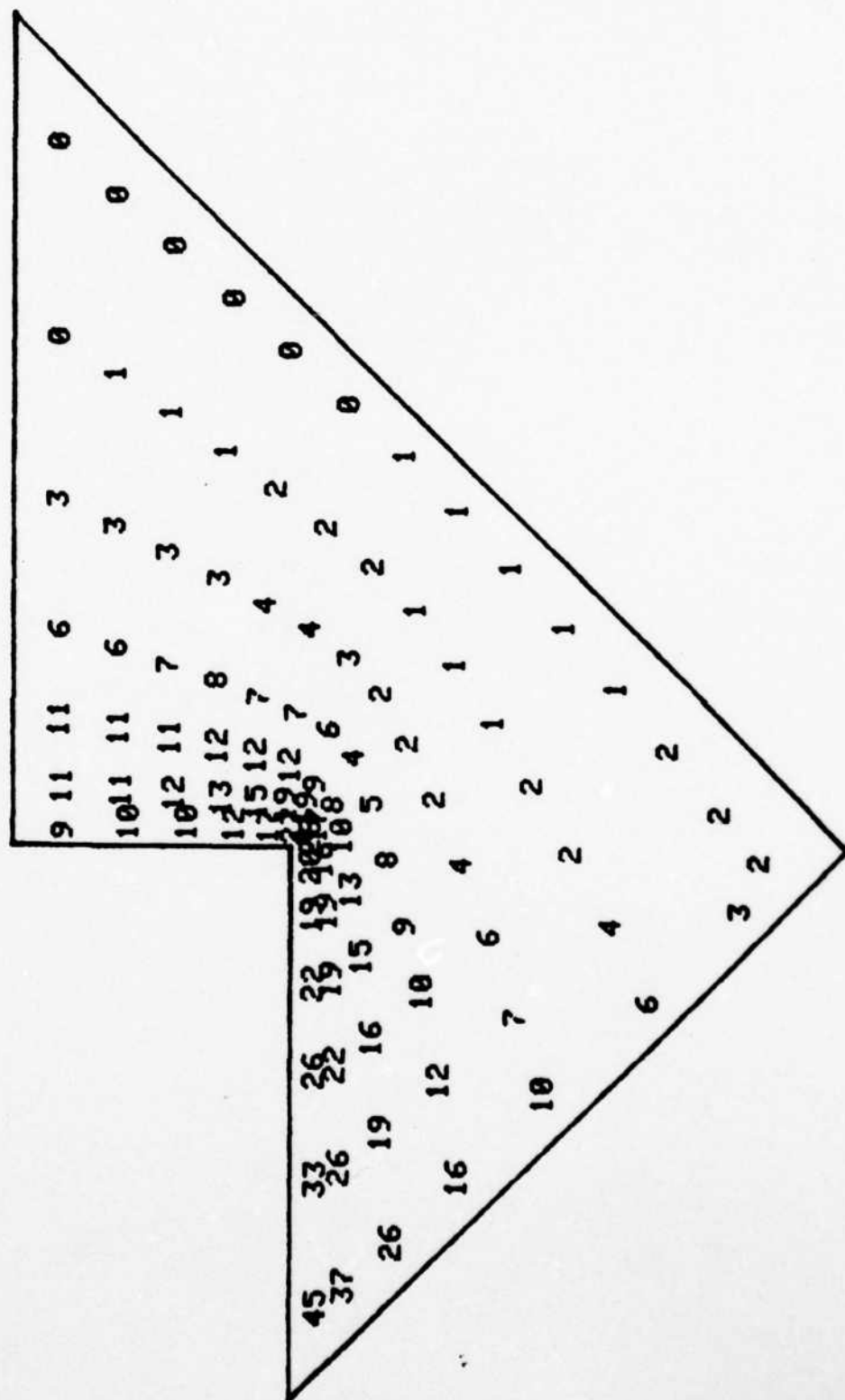
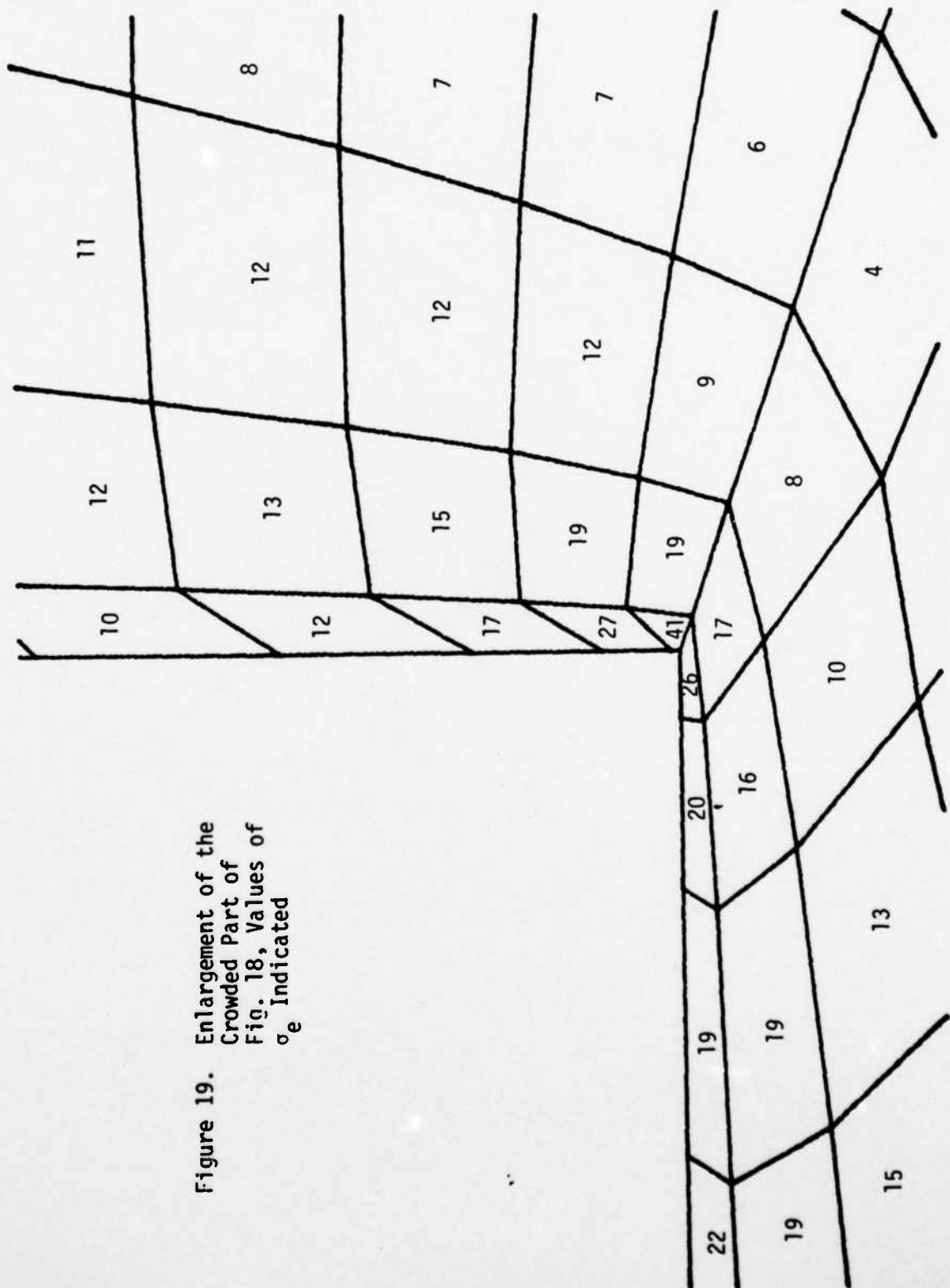
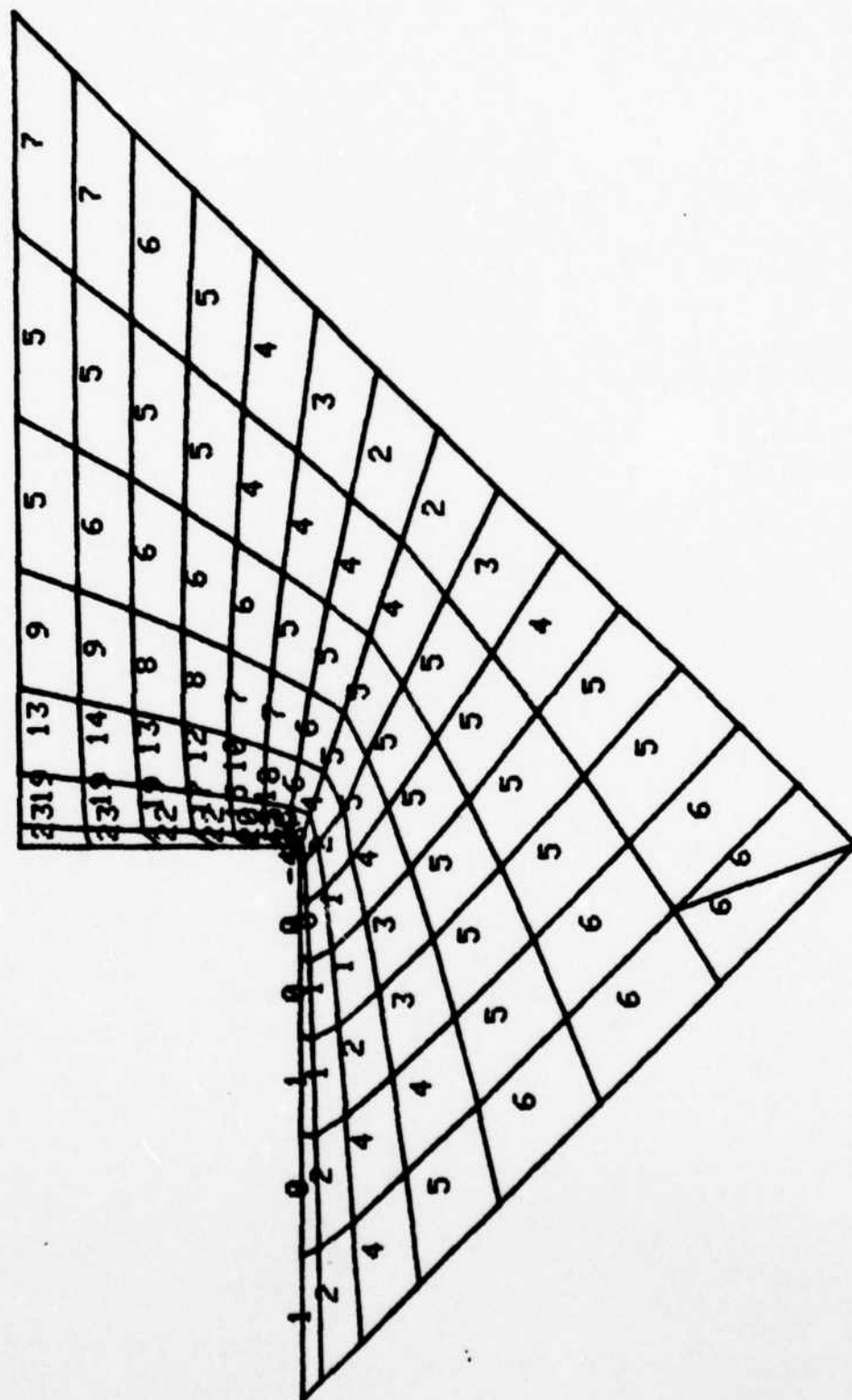
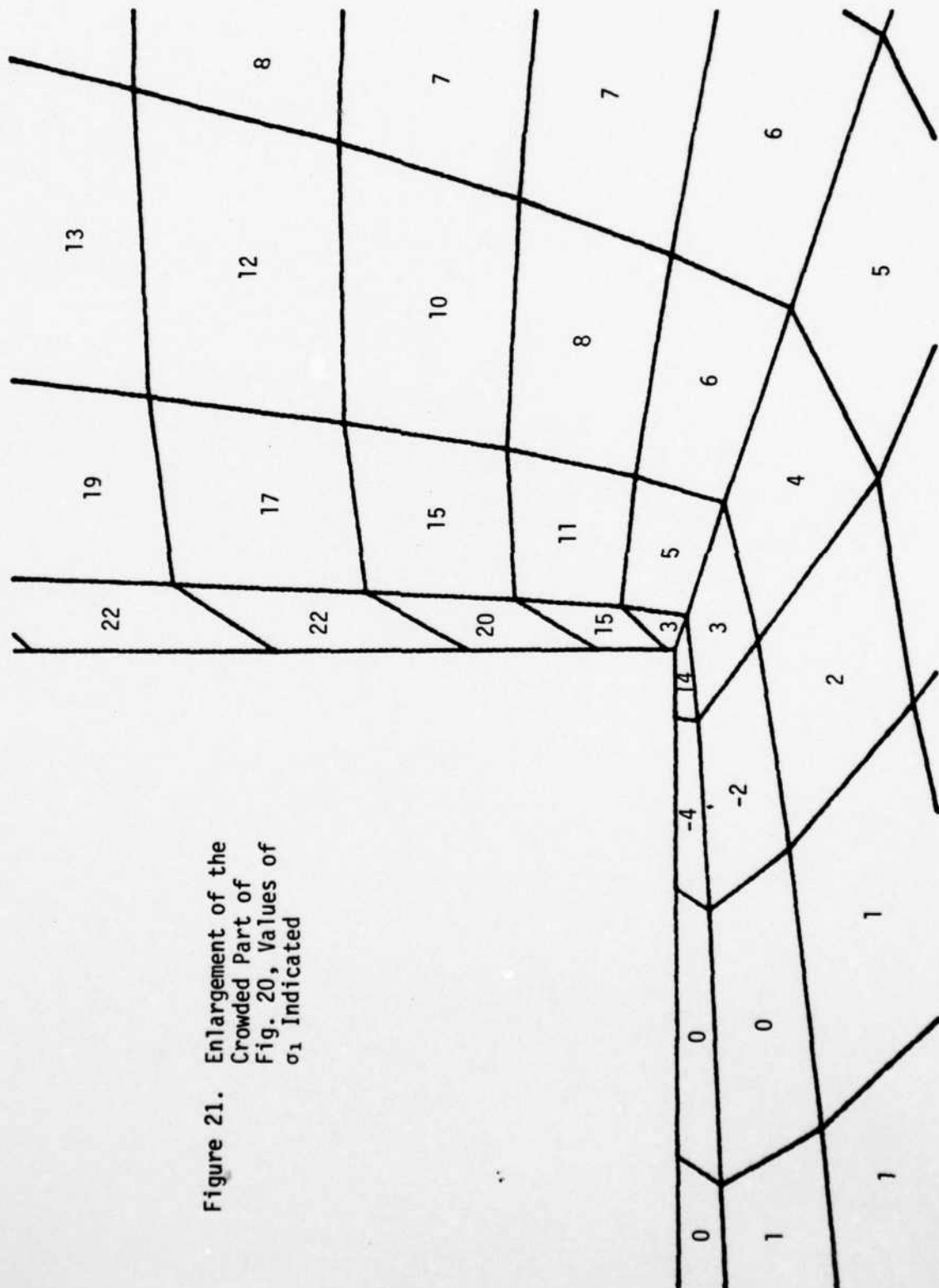


Figure 19. Enlargement of the Crowded Part of Fig. 18, Values of  $\sigma_e$  Indicated









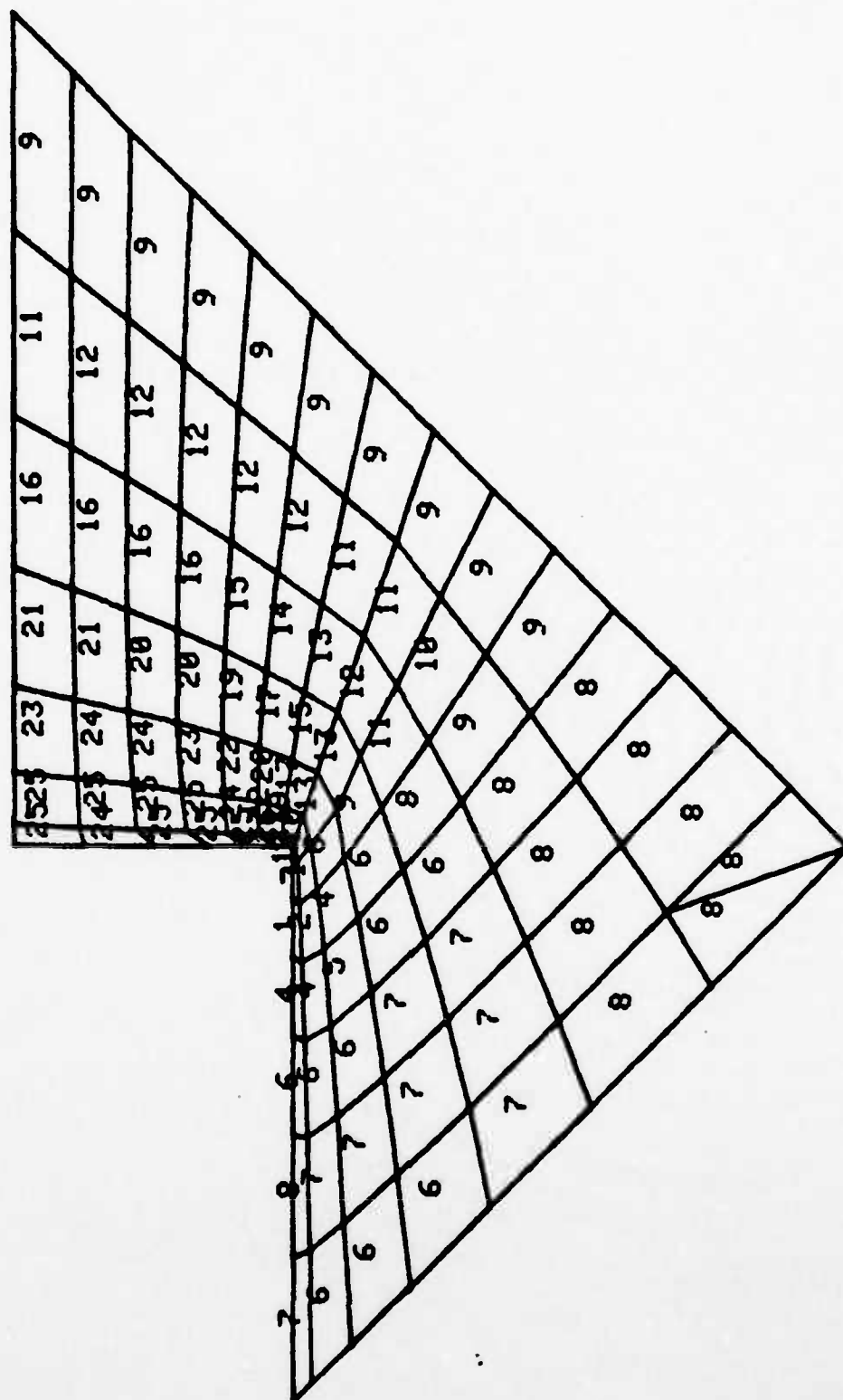
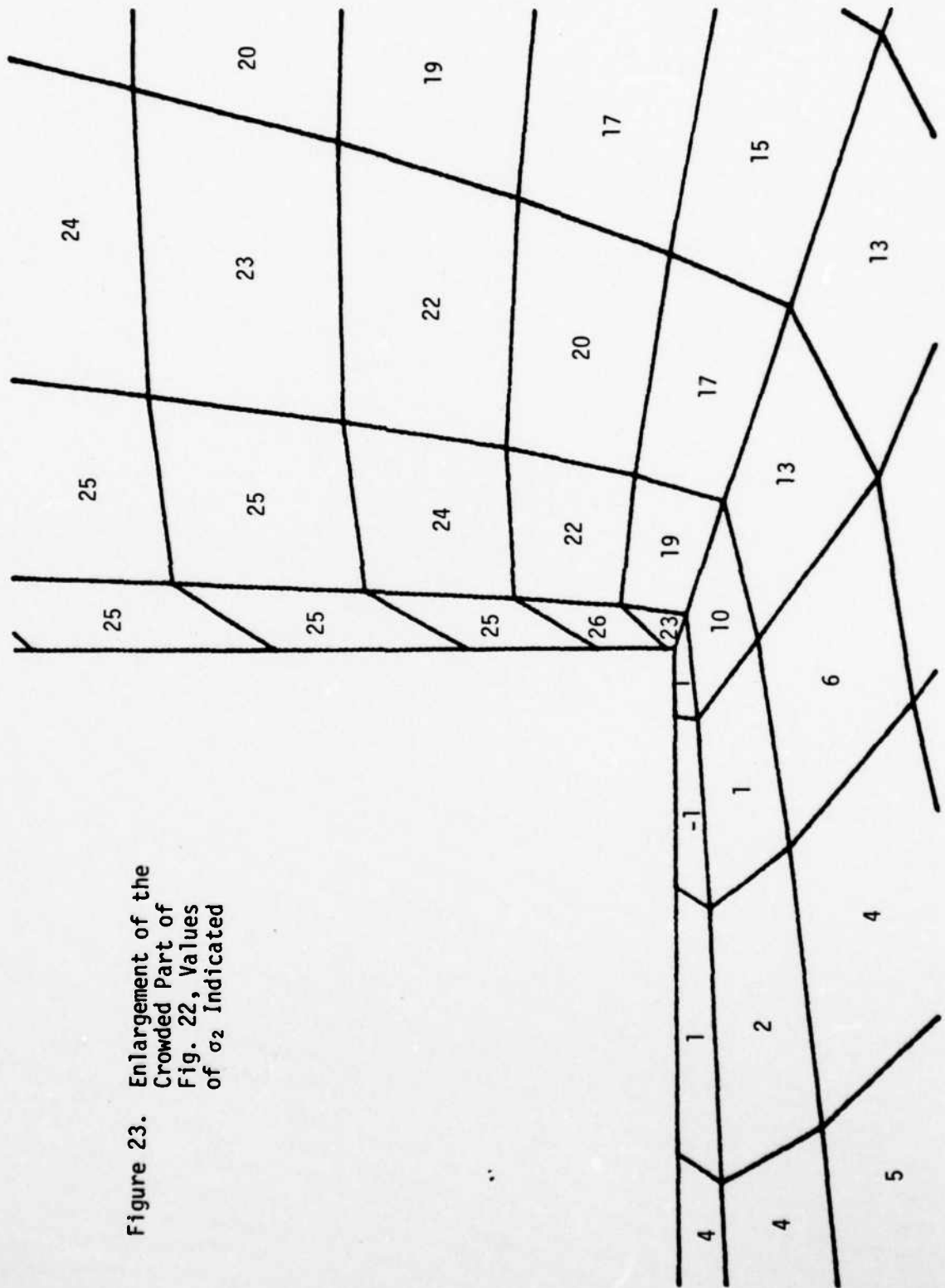


Figure 22. Compressive Principal Stress ( $\sigma_2$ ) After Firing

Figure 23. Enlargement of the Crowded Part of Fig. 22, Values of  $\sigma_2$  Indicated



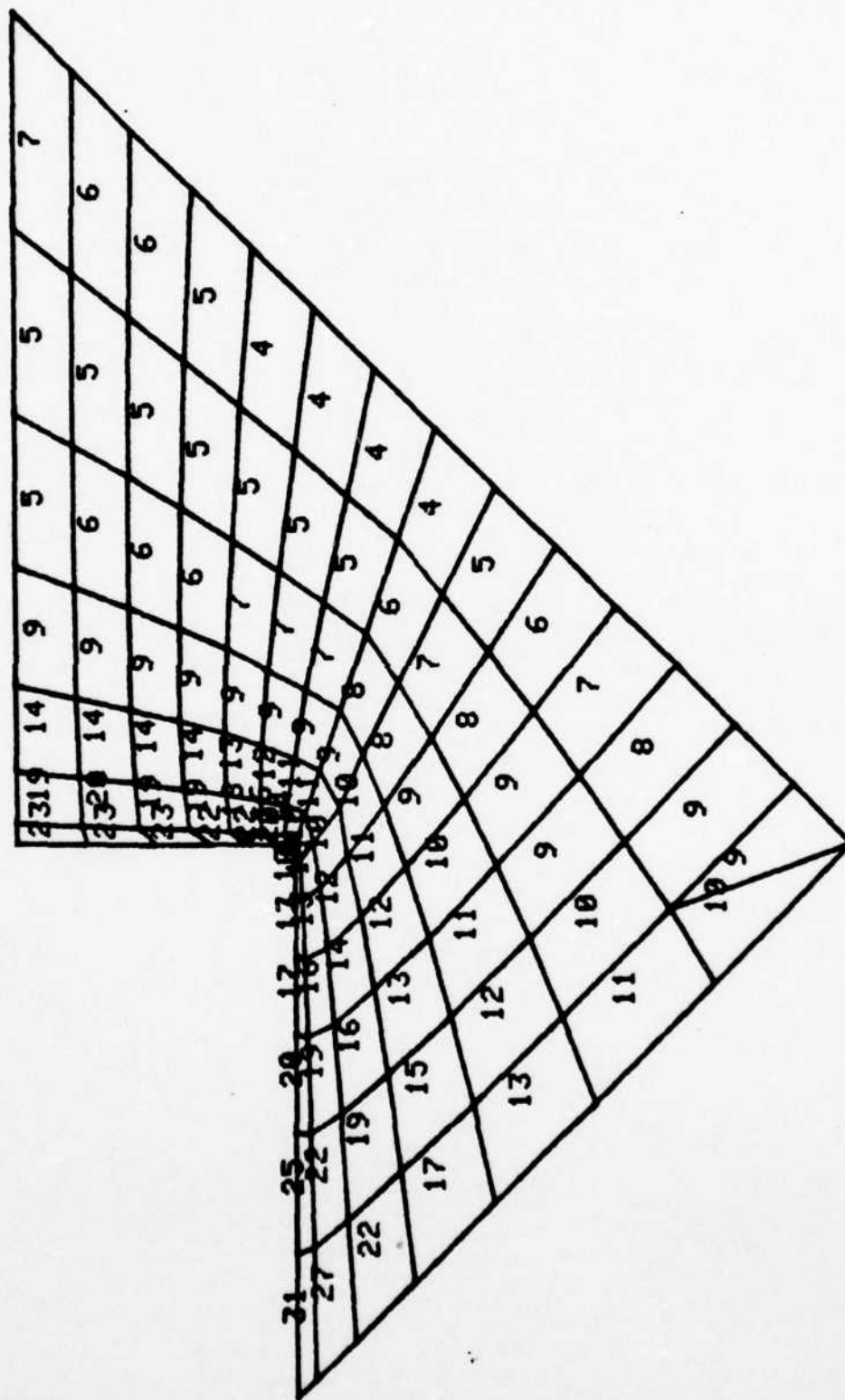
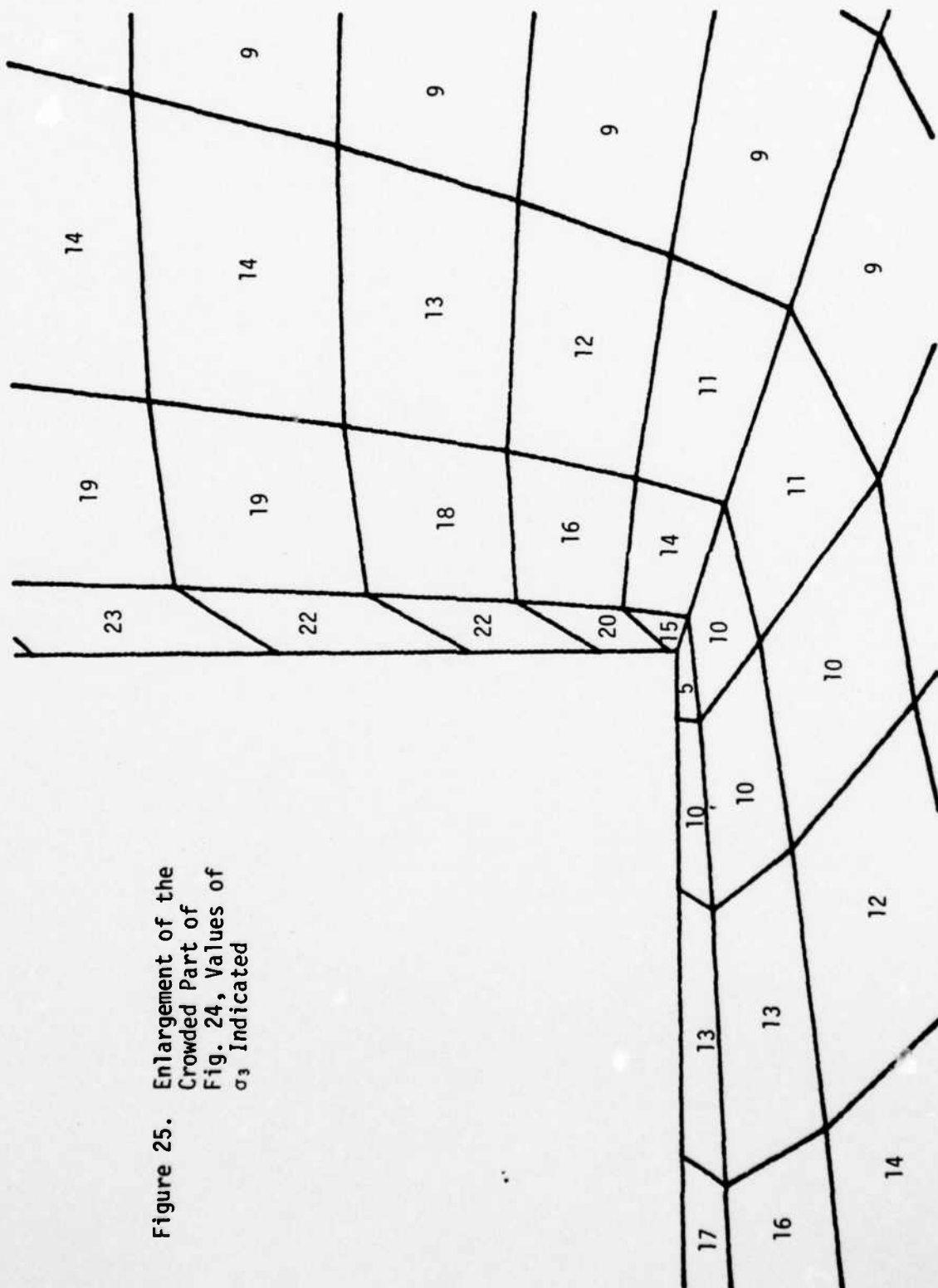


Figure 25. Enlargement of the  
Crowded Part of  
Fig. 24, Values of  
 $\sigma_3$  Indicated



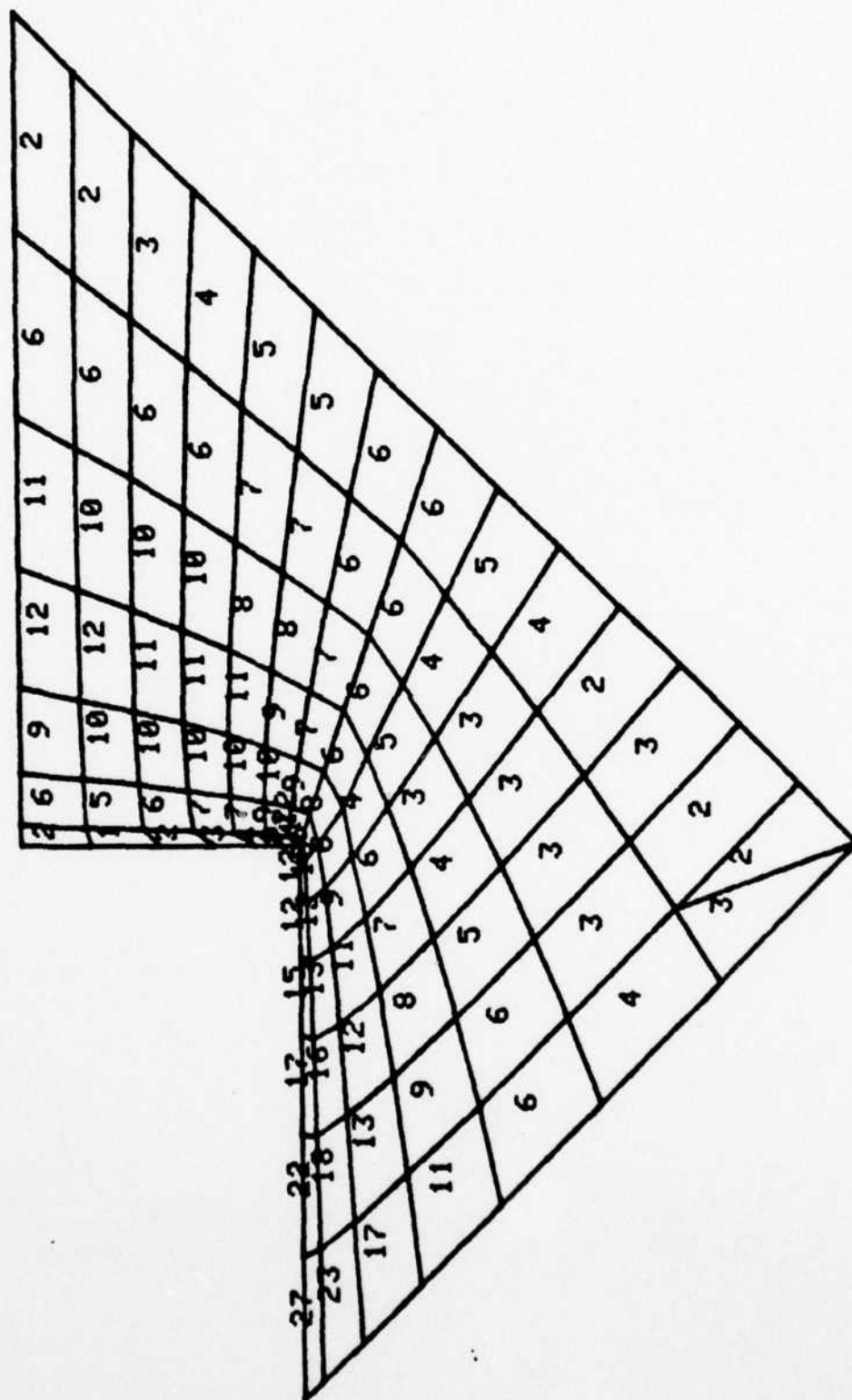
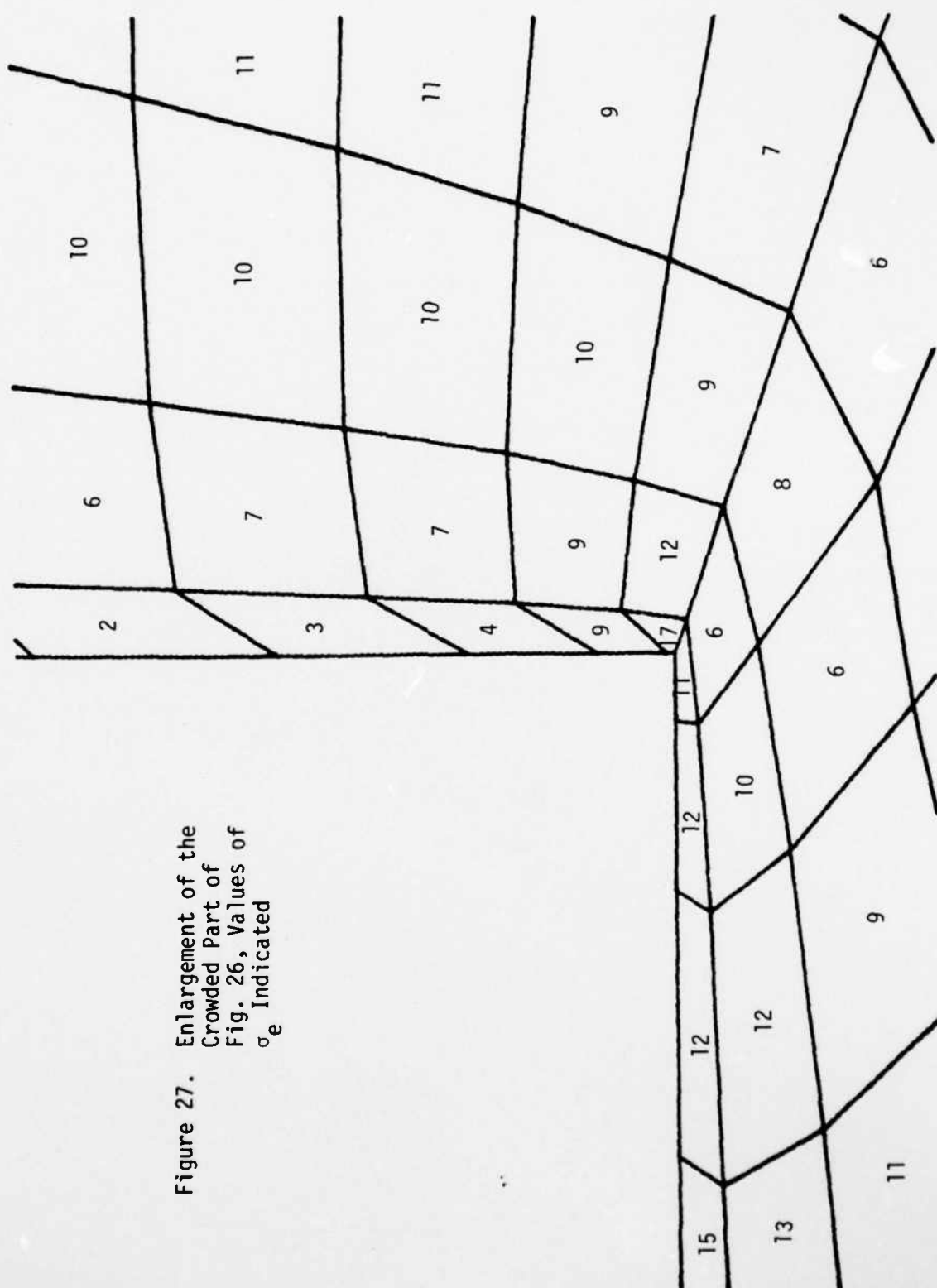


Figure 26. Compressive Equivalent von Mises Stress,  $\sigma_e$  after Firing

Figure 27. Enlargement of the Crowded Part of Fig. 26, Values of  $\sigma_e$  Indicated





### III. DISTRIBUTED BREACH REDESIGN

The results of the previous analysis reveal that improvement could be attained through an appropriate redesign of the breach.

Maximum utilization of material could be achieved by eliminating areas of low stresses. Furthermore, the high stress generated at the mouth of the expendable part may be reduced by the reduction of the mouth extension. Such modifications are implimented as shown in figure 28.

Detailed working drawings of distributed breach parts are included in figures 29-31.

Hot rolled G4140 steel is selected for all the parts of the distributed breach so that it would have the sufficient strength and ductility requirements. Such a material has a yield strength of  $63 \times 10^3$  psi which will provide a factor of safety of 1.4 for the worst loading condition of the initial design.



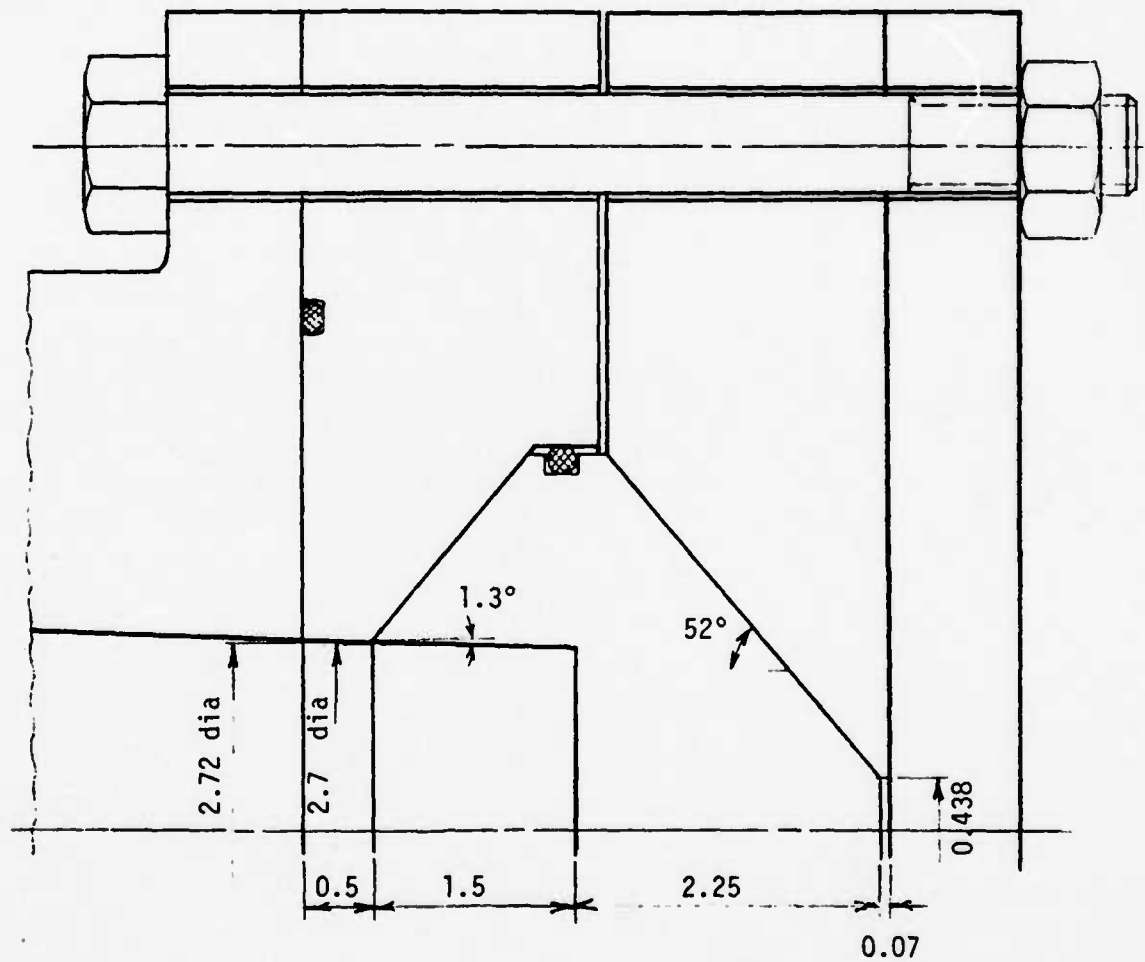
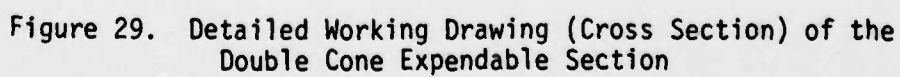


Figure 28. Redesign Modification of Distributed Breach



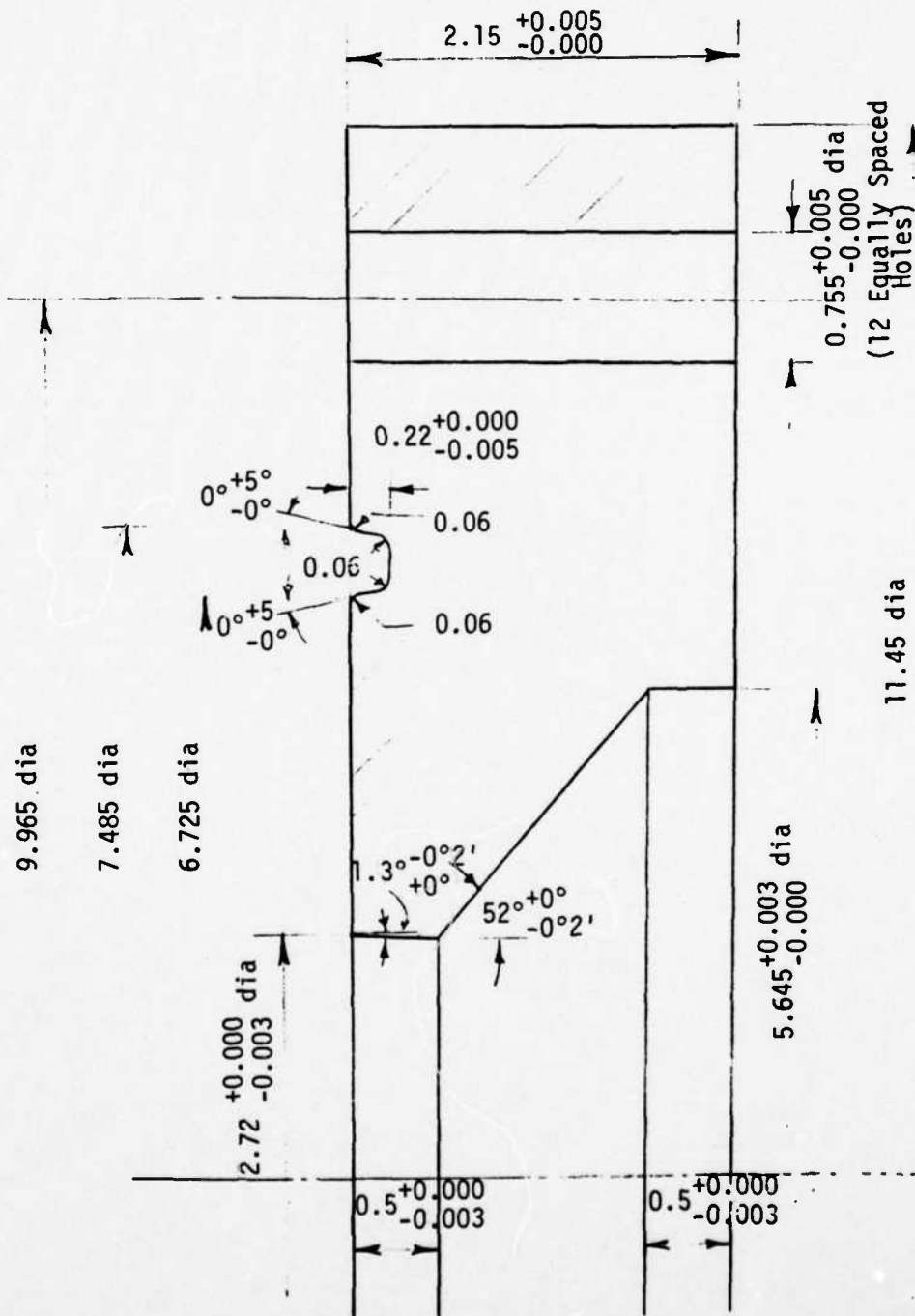


Figure 30. Detailed Working Drawing (Cross Section)  
of the Left Backing Jaw

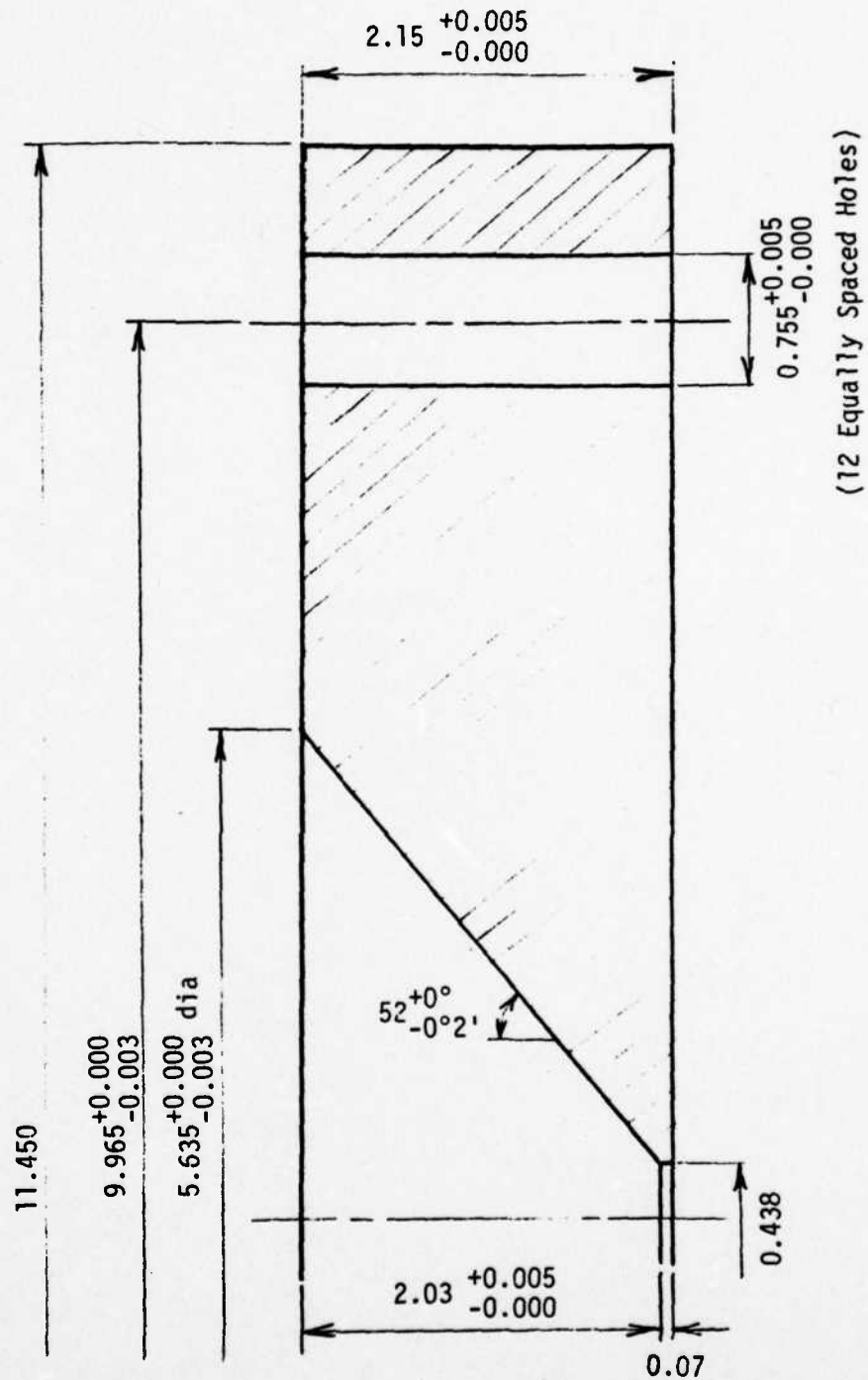


Figure 31: Detailed Working Drawing  
(Cross Section) of the Right  
Backing Jaw

#### IV. TESTING OF THE NEW BREACH

##### IV-1. Charge Calculations

The fundamental principle behind the conical shock tube is that a small conical charge placed at the vertex of the conical tube produces the same shock effect as a spherical charge of equal radius would produce in a free field [1]. The shock tube merely isolates this portion of the wave from the rest and ideally has no effect on the wave characteristics [1]. The shock waves in the tube should be spherical in nature and the explosive energy liberated by the conical charge will be concentrated into the solid angle of the cone rather than radiating in all directions. The small amount of explosive thus behaves like a much larger amount and an amplification is realized. The amplification factor (AF) can then be defined as the weight of apparent spherical charge to that of the actual conical charge. The AF then can be viewed as the ratio of the solid angle of a sphere ( $4\pi$  steradians) to that of the cone.

The form of the shock wave may be approximated by a discontinuous rise in pressure followed by an exponential decay [7]

$$P(t) = P_m \exp(t/\theta). \quad (21)$$

The scaling laws are empirical correlations relating the peak pressure ( $P_m$ ), time constant ( $\theta$ ), and other shock wave parameters to the charge weight ( $W$ ) and the range ( $R$ ) from the charge center. For TNT the following relations apply [8]:

$$P_m = 2.16 \times 10^4 (W^{1/3}/R)^{1.13} \quad (22)$$

$$\theta = 58 W^{1/3} (W^{1/3}/R)^{-0.22} \quad (23)$$

where  $W$  is the charge weight in pounds,  $R$  is the distance from the charge in feet,  $P_m$  is the pressure in psi, and  $\theta$  is the time constant in microseconds.

The tube is to generate a shock wave whose characteristics are equivalent to that of a 125 pound spherical charge of TNT up to a range of 11.0 feet. The

scaling laws show that to match peak pressure the same value of reduced distance ( $W^{1/3}/R$ ) is required. Obviously, this places no constraint on the length of the tube. However, to match the time constant ( $\theta$ ), the same apparent weight must be used since

$$\theta = W^{1/3} f(W^{1/3}/r). \quad (24)$$

Therefore, to match both the peak pressure and the time constant an apparent weight of 125 pounds must be used ( $W_{\text{APPARENT}} = AF(W)_{\text{TRUE}}$ ) and the formal tube length must be at least 11.0 feet from the center of the apparent charge to the muzzle end.

From the old tube, the cone angle

$$\tan \alpha/2 = (3)\text{in}/(11)(12)\text{in}, \quad (25)$$

or  $\alpha = 2 \arctan (0.0227) = 2.6^\circ.$

The theoretical AF can now be determined from [1]

$$AF = \sin^{-2}(2.6/4) = 7770. \quad (26)$$

Assuming for now that this level of amplification is achievable the true weight of explosive required is [1]

$$\begin{aligned} W_{\text{ACTUAL}} &= W_{\text{APPARENT}}/AF \\ &= 7.3 \text{ gm TNT} \end{aligned} \quad (27)$$

The Dupont Company manufactures a flexible sheet explosive with trade name Detasheet which is available in perforated 0.05 inch of what they denote as line wave generator. Blasting caps with a two grain strength were used to initiate the Detasheet. Since Detasheet is made of PENT, and since 1 gram of TNT is equivalent to 9.45 grains and 1 gram of PENT is equivalent to 15.4 grain, then the actual weight of the Detasheet (used for the 7.3gm TNT) should then be

$$W_{\text{ACTUAL}} = 7.3 \left( \frac{9.45}{15.4} \right) = 4.48 \text{ gm} \quad (28)$$

The two grains blasting cap should replace

$$\begin{aligned} W_{\text{DETASHEET}} &= 2 \text{ grains} \\ &= \frac{2}{15.4} = 0.13 \text{ gm} \end{aligned} \quad (29)$$

The net required Detasheet that should generate the same energy as required at the vertex of the cone is then

$$W_{\text{DETASHEET}} = 4.48 - 0.13 = 4.35 \text{ gm} \quad (30)$$

With the known density of the perforated Detasheet, this weight should come from more than one layer of the explosives.

#### IV-2 Test Results

Five tests have been conducted at NRL-Orlando with the new design withstanding all of them without any sign of failure to the distributed breach. The only observation is the minor imprint on the surface due to the perforated pattern of the line wave generator (Fig. 32). No change in shape or dimensions has resulted and no plastic deformation occurred.

The first shot (#1) was conducted with only 2.6 gm of Detasheet. This represented only one layer of the explosives and was selected as primary test. The resulting pressure wave is shown in Fig. 33. With approximate extrapolation of the curve and using the approximate calibration of this gage (76B,-253.1 dB/1V/ $\mu$ Pa), the peak pressure was found to be approximately 7500 psi. Using the scaling laws ratio, the pressure for a full charge should have been approximately 9000 psi. The expected pressure at this distance (10 ft) for a 125 pound spherical charge of TNT is 9869 psi (see Eqn. 22). This would give an efficiency of about 91%.

The next two shots (#2 & #3) were carried out with the full charge of 4.35 gm of Detasheet. Due to probe failure in shot #2, the results were discarded. Shot #3 resulted in the pressure wave shown in Fig. 34. Performing the approximate extrapolation and calculations, we can find the pressure to be 8800 psi. This would represent an efficiency of about 89%.



Fig. 32



(#E 0) SHOT NO 1 PAGE 76B

SHOKDB.1H2

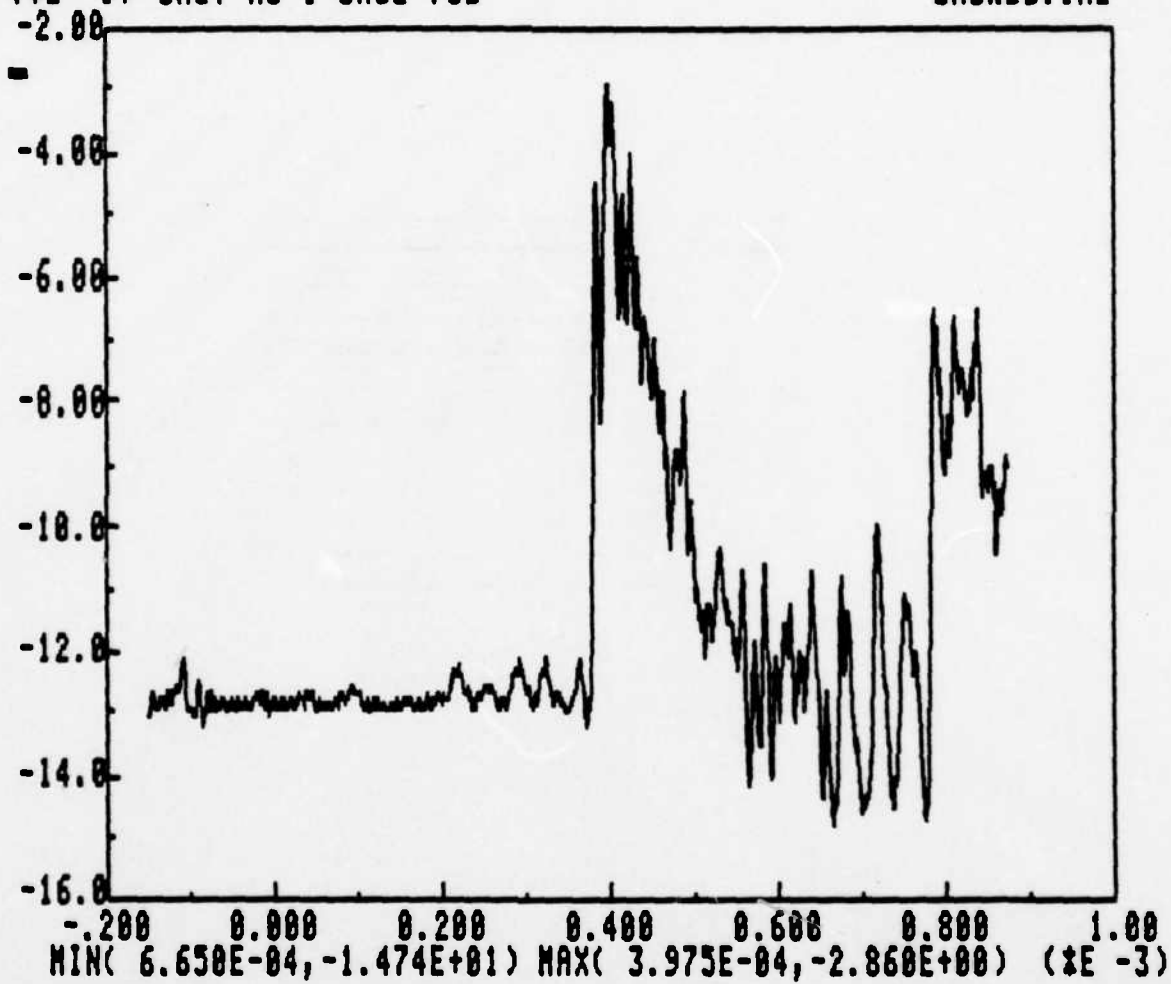


Fig. 33

(#E 0) SHOT NO 3 GAGE 78B

SHOKDB.3H1

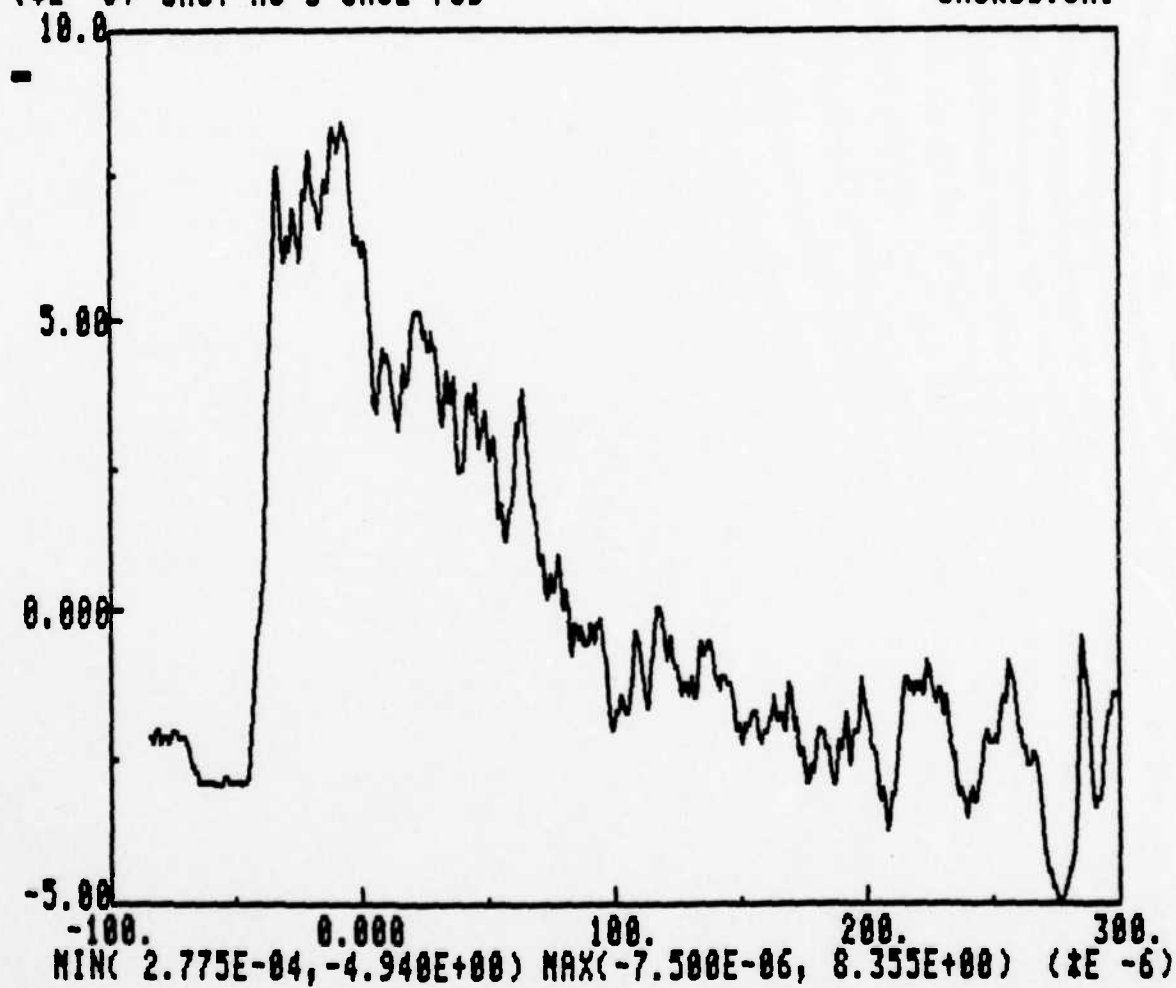


Fig. 34

The following two shots (#4 and #5) were performed with a fortified rubber gasket inserted between the breach assembly and the tube and with the full charge of 4.35gm. The results are shown in Figs. 35 and 36. Although no calibration value is available for the gage used, the pressure response has improved particularly at the peak.

In all tests, however, the pressure gage mounting has suffered from the blast and needed to be changed.

(#E 0) SHOT NO 2

SHOKDB.0H2;1

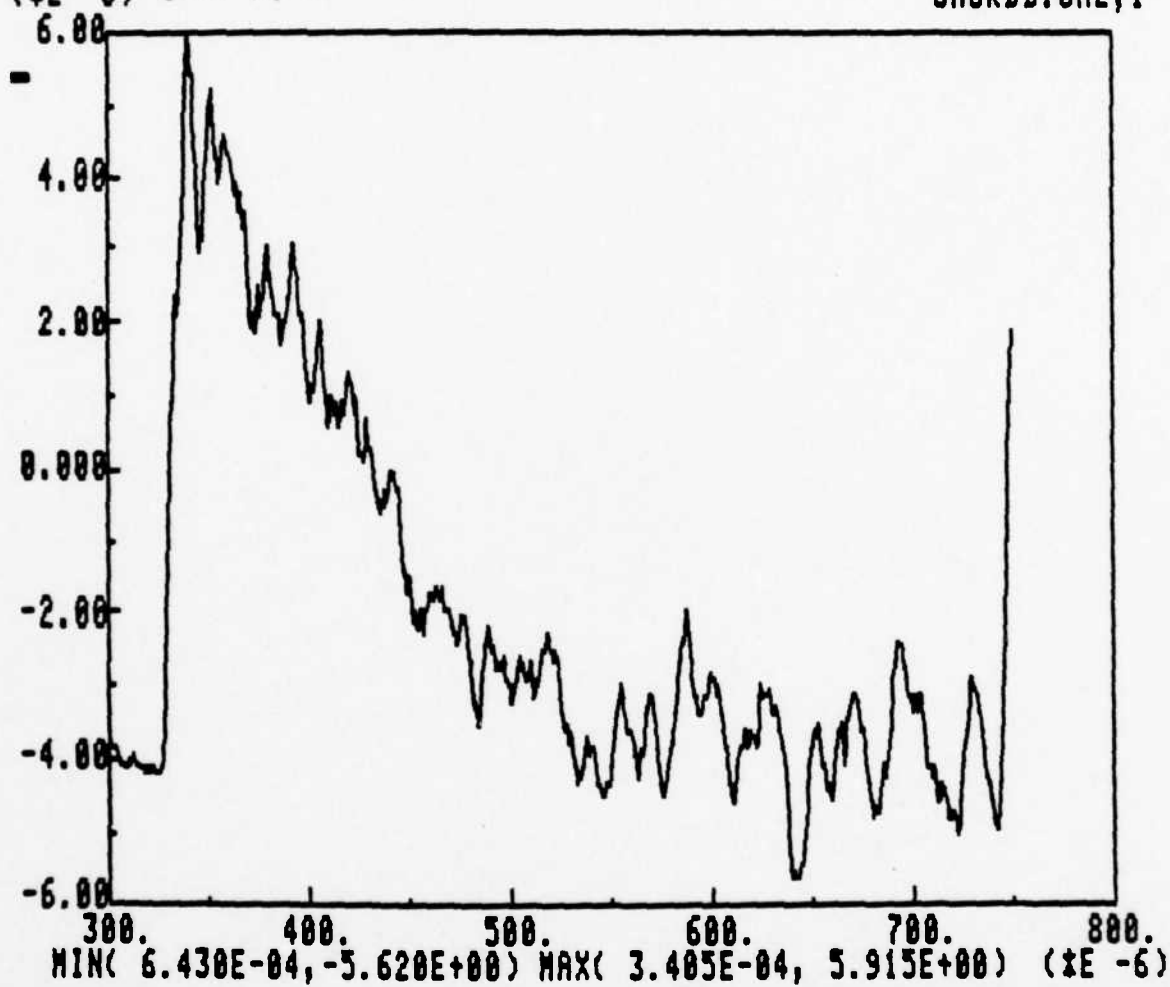


Fig. 35

(#E 0) SUCT: 0.5

SHOKDB.0H2;2

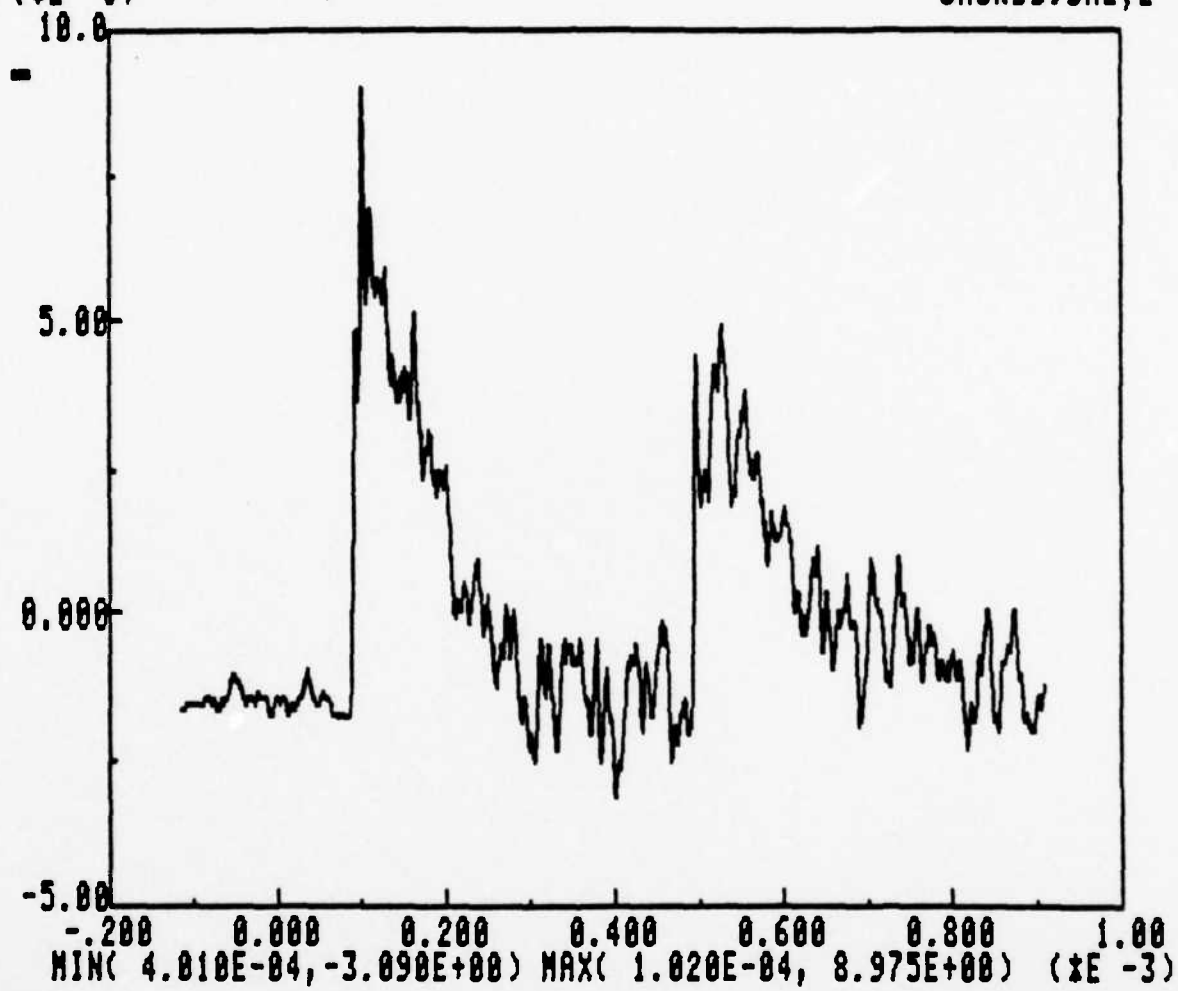


Fig. 36

## V. CONCLUSION

Test results of the new distributed breach design indicate that the new design can withstand the full load without any sign of failure or damage. The efficiency of simulating real blasts is about 90% which is very high compared to the efficiency of the old tube. The pressure gages, however, have suffered from the shock wave and required replacement almost after every shot. A different type of gages might be used and a different gage mounting should be designed.

APPENDIX A

Program listing for element mesh drawing  
and displaying element number  
and stress values at element  
center

```

LIS  REM ELEMENT GRAPHIC FOR SHOCK TUBE
99  INIT
100 PAGE
110 VIEWPORT 0,130,90,-10
130 WINDOW 0,5,0,3.6
140 READ M,N
150 DIM X(N),Y(N),J(N,4)
160 DIM X5(M),Y5(M)
170 FOR I=1 TO M
180 FOR K=1 TO 4
190 READ J(I,K)
200 NEXT K
210 NEXT I
220 FOR L=1 TO N
230 READ Y(L),X(L)
240 NEXT L
250 FOR I=1 TO M
260 N1=J(I,1)
270 MOVE X(N1),Y(N1)
280 FOR K=2 TO 4
290 N1=J(I,K)
300 DRAW X(N1),Y(N1)
310 NEXT K
320 N1=J(I,1)
330 DRAW X(N1),Y(N1)
340 NEXT I
350 FOR I=1 TO M
360 I1=J(I,1)
370 I2=J(I,2)
380 I3=J(I,3)
390 I4=J(I,4)
400 X1=(X(I1)+X(I4))/2
410 Y1=(Y(I1)+Y(I4))/2
420 X2=(X(I2)+X(I3))/2

```



```

430 Y2=(Y(I2)+Y(I3))/2
440 X3=(X(I1)+X(I2))/2
450 Y3=(Y(I1)+Y(I2))/2
460 X4=(X(I3)+X(I4))/2
470 Y4=(Y(I3)+Y(I4))/2
480 A1=Y1-Y2
490 B1=X2-X1
500 C1=X2*Y1-X1*Y2
510 A2=Y3-Y4
520 B2=X4-X3
530 C2=X4*Y3-X3*Y4
540 D=A1*B2-A2*B1
550 X5(I)=(C1*B2-C2*B1)/D
560 Y5(I)=(A1*C2-C1*A2)/D
570 MOVE X5(I),Y5(I)
580 DRAW X5(I),Y5(I)
590 NEXT I
600 DATA 1,9,10,2,2,10,11,3,3,11,12,4,4,12,13,5,5,13,14,6
610 DATA 1,9,10,2,2,10,11,3,3,11,12,4,4,12,13,5,5,13,14,6
620 DATA 6,14,15,7,16,8,7,15,9,17,18,10,10,18,19,19,11,11,19,20,12
630 DATA 12,20,21,13,19,27,33,34,26,28,20,20,26,34,35,27,27,33,41,42,34,48,40,39,47
640 DATA 18,26,27,19,25,33,38,39,31,40,37,37,45,51,43,43,51,52,44,44,52,53,45,53,54,46
650 DATA 32,24,23,31,25,33,38,39,36,44,45,51,43,43,51,52,44,44,52,53,45,53,45,53,54,46
660 DATA 29,37,38,30,36,44,45,51,43,43,51,52,44,44,52,53,45,53,45,53,45,53,45,53,45,46
670 DATA 35,43,44,36,44,45,51,43,43,51,52,44,44,52,53,45,53,45,53,45,53,45,53,45,46
680 DATA 41,49,50,42,42,56,48,47,55,49,54,62,63,55,64,56,69,70,62,62,70,71,63
690 DATA 46,54,55,47,56,48,47,55,49,54,62,63,55,64,56,69,70,62,62,70,71,63
700 DATA 52,60,61,53,59,67,68,60,66,66,74,75,67,75,76,68,68,76,77,69
710 DATA 58,66,67,59,67,68,60,66,66,74,75,67,75,76,68,68,76,77,69
720 DATA 72,64,63,71,65,73,74,66,66,74,75,67,75,76,68,68,76,77,69
730 DATA 69,77,78,70,76,84,85,77,77,85,86,78,81,89,90,91,83,83,91,92,84,84,90,98,99,91,91,100,92
740 DATA 75,83,84,76,76,84,85,77,77,85,86,78,81,89,90,91,83,83,91,92,84,84,90,98,99,91,91,100,92
750 DATA 81,89,90,82,82,90,91,83,83,91,92,84,84,90,98,99,91,91,100,92
760 DATA 86,94,95,87,96,88,87,95,89,97,98,90,90,98,99,91,91,100,92
770 DATA 92,100,101,93,93,101,102,94,94,102,94,94,102,103,95,104,96,95,103

```

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LIS
90 REM ELEMENT GRAPHIC FOR SHOCK TUBE
100 INIT
200 PAGE
250 VIEWPORT 0,130,90,-10
300 WINDOW 0,5,0,3.6
400 READ M,N
420 DIM X(N),Y(N),J(N,4)
500 FOR I=1 TO M
600 FOR K=1 TO 4
700 READ J(I,K)
800 NEXT K
900 NEXT I
1000 FOR L=1 TO M
1100 READ Y(L),X(L)
1200 NEXT L
1300 FOR I=1 TO M
1400 NI=J(I,1)
1500 MOVE X(NI),Y(NI)
1600 FOR K=2 TO 4
1700 NI=J(I,K)
1800 DRAW X(NI),Y(NI)
1900 NEXT K
2000 NI=J(I,1)
2100 DRAW X(NI),Y(NI)
2200 NEXT I
2300 DATA 99,120
2301 DATA 1,9,10,2,2,10,11,3,3,11,12,4,4,12,13,5,5,13,14,6
2305 DATA 6,14,15,7,16,8,7,15,9,17,18,10,10,18,19,11,11,19,20,12
2307 DATA 12,20,21,13,13,21,22,14,14,22,23,15,24,16,15,23,17,25,26,18
2310 DATA 18,26,27,19,19,27,28,20,20,28,29,21,21,29,30,22,22,30,31,23
2312 DATA 32,24,23,31,25,33,34,26,26,34,35,27,27,35,36,28,28,36,37,29
2314 DATA 29,37,38,30,38,39,31,40,32,31,39,33,41,42,34,42,43,35
2316 DATA 35,43,44,36,36,44,45,37,37,45,38,38,46,47,39,48,40,39,47
2318 DATA 41,49,50,42,42,50,51,43,43,51,52,44,44,52,53,45,53,54,46

```

2320	DATA	46, 54, 55, 47, 56, 48, 47, 55, 49, 57, 58, 50, 58, 59, 51, 51, 59, 60, 52
2322	DATA	52, 60, 61, 53, 53, 61, 62, 54, 54, 62, 63, 55, 64, 56, 55, 63, 57, 65, 66, 58
2330	DATA	58, 66, 67, 59, 59, 67, 68, 60, 60, 68, 69, 61, 61, 69, 70, 62, 62, 70, 71, 63
2340	DATA	72, 64, 63, 71, 65, 73, 74, 66, 66, 74, 75, 67, 67, 75, 76, 68, 76, 77, 69
2350	DATA	69, 77, 78, 70, 70, 78, 79, 71, 80, 72, 71, 79, 73, 81, 82, 74, 82, 83, 75
2360	DATA	75, 83, 84, 76, 76, 84, 85, 77, 77, 85, 86, 78, 86, 87, 79, 88, 80, 79, 87
2370	DATA	81, 89, 90, 82, 82, 90, 91, 83, 83, 91, 92, 84, 84, 92, 93, 85, 85, 93, 94, 86
2380	DATA	86, 94, 95, 87, 96, 88, 87, 95, 89, 97, 98, 90, 90, 98, 99, 91, 91, 99, 100, 92
2390	DATA	92, 100, 101, 93, 93, 101, 102, 94, 94, 102, 103, 95, 104, 96, 95, 103
2400	DATA	97, 105, 106, 98, 98, 106, 107, 99, 99, 107, 108, 100, 100, 108, 109, 101
2410	DATA	101, 109, 110, 102, 102, 110, 111, 103, 112, 104, 103, 111
2420	DATA	113, 114, 106, 105, 114, 115, 107, 106, 115, 116, 108, 107
2430	DATA	116, 117, 109, 108, 117, 118, 110, 109, 118, 119, 111, 110
2440	DATA	120, 112, 111, 111, 119, 120, 111, 111
2450	DATA	0, 2
2460	DATA	0, 2.071
2470	DATA	0, 2.261
2480	DATA	0, 2.571
2490	DATA	0, 2.999
2500	DATA	0, 3.547
2510	DATA	0, 4.214
2520	DATA	0, 5
2530	DATA	0, 256, 2
2540	DATA	0, 241, 2.065
2550	DATA	0, 229, 2.24
2560	DATA	0, 222, 2.527
2570	DATA	0, 214, 2.925
2580	DATA	0, 211, 3.434
2590	DATA	0, 211, 4.054
2600	DATA	0, 214, 4.786
2610	DATA	0, 514, 2
2620	DATA	0, 449, 2.058
2630	DATA	0, 431, 2.219
2640	DATA	0, 418, 2.484
2650	DATA	0, 412, 2.851

2660	DATA	0.412,3.322
2670	DATA	0.417,3.895
2680	DATA	0.429,4.571
2690	DATA	0.703,2.052
2700	DATA	0.625,2.199
2710	DATA	0.606,2.44
2720	DATA	0.595,2.777
2730	DATA	0.594,2.209
2740	DATA	0.601,3.736
2750	DATA	0.618,3.357
2760	DATA	0.643,2.845
2770	DATA	0.846,2.045
2780	DATA	0.77,2.178
2790	DATA	0.754,2.397
2800	DATA	0.751,2.703
2810	DATA	0.76,2.896
2820	DATA	0.78,3.576
2830	DATA	0.813,3.143
2840	DATA	0.857,4.039
2850	DATA	0.943,2.039
2860	DATA	0.881,2.157
2870	DATA	0.876,2.353
2880	DATA	0.885,2.629
2890	DATA	0.909,2.983
2900	DATA	0.948,2.417
2910	DATA	1.002,3.929
2920	DATA	1.071,3.033
2930	DATA	0.994,2.136
2940	DATA	0.961,2.31
2950	DATA	0.971,2.555
2960	DATA	0.998,2.871
2970	DATA	1.043,2.257
2980	DATA	1.106,3.714
2990	DATA	1.187,3.714
3000	DATA	1.286,3.714

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3020	DATA	1.009,2.026	
3030	DATA	1.038,2.115	
3040	DATA	1.089,2.267	
3050	DATA	1.16,2.481	
3060	DATA	1.253,2.758	
3070	DATA	1.366,3.098	
3080	DATA	1.5,3.5	
3090	DATA	1,1.945	
3100	DATA	1.017,1.943	
3110	DATA	1.063,2.006	
3120	DATA	1.156,2.134	
3130	DATA	1.238,2.325	
3140	DATA	1.368,2.581	
3150	DATA	1.527,2.901	
3160	DATA	1.714,3.286	
3170	DATA	1,1.812	
3180	DATA	1.025,1.795	
3190	DATA	1.086,1.843	
3200	DATA	1.182,1.957	
3210	DATA	1.315,2.137	
3220	DATA	1.484,2.383	
3230	DATA	1.688,2.694	
3240	DATA	1.929,3.071	
3250	DATA	1,1.603	
3260	DATA	1.033,1.58	
3270	DATA	1.109,1.625	
3280	DATA	1.229,1.737	
3290	DATA	1.393,1.916	
3300	DATA	1.599,2.162	
3310	DATA	1.849,2.476	
3320	DATA	2.143,2.857	
3330	DATA	1,1.318	
3340	DATA	1.041,1.3	
3350	DATA	1.134,1.352	

3360	DATA	1.276,1.472
3370	DATA	1.47,1.662
3380	DATA	1.715,1.92
3390	DATA	2.01,2.247
3400	DATA	2.357,2.643
3410	DATA	1.0.955
3420	DATA	1.049,0.954
3430	DATA	1.157,1.024
3440	DATA	1.323,1.164
3450	DATA	1.547,1.375
3460	DATA	1.83,1.656
3470	DATA	2.172,2.007
3480	DATA	2.571,2.429
3490	DATA	1.0.516
3500	DATA	1.057,0.543
3510	DATA	1.18,0.642
3520	DATA	1.37,0.812
3530	DATA	1.625,1.055
3540	DATA	1.946,1.369
3550	DATA	2.333,1.756
3560	DATA	2.786,2.214
3570	DATA	1.0
3580	DATA	1.065,0.065
3590	DATA	1.204,0.204
3600	DATA	1.416,0.416
3610	DATA	1.702,0.702
3620	DATA	2.061,1.061
3630	DATA	2.494,1.494
3640	DATA	3,2
5000	HOME	
5100	END	

LIS 3022,5000  
 3022 REM -----  
 3025 REM DATA OF STRESSES BEFORE FIRING  
 3030 DATA 0,9,9  
 3040 DATA 0,11,11  
 3050 DATA 1,12,12  
 3060 DATA 7,13,13  
 3070 DATA 9,12,12  
 3080 DATA 11,11,11  
 3090 DATA 11,11,11  
 3100 DATA 0,10,10  
 3110 DATA 0,11,11  
 3120 DATA 2,13,13  
 3130 DATA 6,13,13  
 3140 DATA 9,12,12  
 3150 DATA 10,11,11  
 3160 DATA 11,11,11  
 3170 DATA 0,11,10  
 3180 DATA 0,13,12  
 3190 DATA 2,14,13  
 3200 DATA 6,14,13  
 3210 DATA 9,12,12  
 3220 DATA 10,11,11  
 3230 DATA 11,11,11  
 3240 DATA 0,14,11  
 3250 DATA 1,15,13  
 3260 DATA 3,16,14  
 3270 DATA 6,14,14  
 3280 DATA 9,13,12  
 3290 DATA 10,12,11  
 3300 DATA 11,11,11  
 3310 DATA 0,20,14  
 3320 DATA 2,19,15  
 3330 DATA 4,18,15  
 3340 DATA 7,15,14



3700	DATA	12, 14, 15
3710	DATA	12, 12, 13
3720	DATA	10, 11, 11
3730	DATA	1, 18, 26
3740	DATA	2, 18, 24
3750	DATA	4, 18, 21
3760	DATA	8, 16, 19
3770	DATA	11, 14, 16
3780	DATA	11, 13, 14
3790	DATA	10, 11, 12
3800	DATA	1, 19, 31
3810	DATA	2, 18, 28
3820	DATA	5, 17, 24
3830	DATA	8, 15, 20
3840	DATA	10, 13, 17
3850	DATA	11, 13, 14
3860	DATA	10, 12, 12
3870	DATA	0, 20, 39
3880	DATA	3, 18, 34
3900	DATA	6, 15, 28
3910	DATA	8, 13, 22
3920	DATA	9, 12, 18
3930	DATA	10, 12, 15
3940	DATA	10, 12, 13
3950	DATA	1, 15, 52
3960	DATA	3, 13, 44
3970	DATA	5, 12, 34
3980	DATA	6, 12, 25
3990	DATA	7, 12, 19
4000	DATA	8, 12, 15
4010	DATA	10, 12, 13
4020	DATA	10, 13, 14
5000	HOME	

3350	DATA	9, 13, 13
3360	DATA	10, 12, 12
3370	DATA	11, 11, 11
3380	DATA	0, 32, 18
3390	DATA	4, 26, 16
3400	DATA	6, 20, 16
3410	DATA	8, 16, 14
3420	DATA	9, 13, 13
3430	DATA	10, 12, 12
3440	DATA	11, 11, 11
3450	DATA	10, 58, 30
3460	DATA	9, 31, 21
3470	DATA	9, 20, 17
3480	DATA	9, 16, 14
3490	DATA	10, 14, 13
3500	DATA	10, 12, 12
3510	DATA	10, 11, 11
3520	DATA	13, 43, 27
3530	DATA	14, 34, 24
3540	DATA	12, 22, 18
3550	DATA	11, 16, 15
3560	DATA	11, 14, 13
3570	DATA	11, 12, 12
3580	DATA	10, 11, 11
3590	DATA	1, 23, 20
3600	DATA	7, 25, 22
3610	DATA	11, 23, 20
3620	DATA	12, 17, 17
3630	DATA	12, 14, 14
3640	DATA	11, 12, 12
3650	DATA	10, 11, 11
3660	DATA	1, 19, 22
3670	DATA	1, 19, 21
3680	DATA	6, 20, 20
3690	DATA	10, 18, 18

DATA OF STRESSES BEFORE FIRING

2030	DATA	23, 25, 23
2040	DATA	19, 25, 19
2050	DATA	13, 23, 14
2060	DATA	9, 21, 9
2070	DATA	5, 16, 5
2080	DATA	5, 11, 5
2090	DATA	7, 9, 7
2100	DATA	23, 24, 23
2110	DATA	19, 25, 20
2120	DATA	14, 24, 14
2130	DATA	9, 21, 9
2140	DATA	6, 16, 6
2150	DATA	5, 12, 5
2160	DATA	7, 9, 6
2170	DATA	22, 25, 23
2180	DATA	19, 25, 19
2190	DATA	13, 24, 14
2200	DATA	8, 20, 9
2210	DATA	6, 16, 6
2220	DATA	5, 12, 5
2230	DATA	6, 9, 6
2240	DATA	22, 25, 22
2250	DATA	17, 25, 19
2260	DATA	12, 23, 14
2270	DATA	8, 20, 9
2280	DATA	6, 16, 6
2290	DATA	5, 12, 5
2300	DATA	5, 9, 5
2310	DATA	20, 25, 22
2320	DATA	15, 24, 18
2330	DATA	10, 22, 13
2340	DATA	7, 19, 9
2350	DATA	6, 15, 7
2360	DATA	4, 12, 5
2370	DATA	4, 9, 4

2380	DATA	15, 26, 20
2390	DATA	11, 22, 16
2400	DATA	8, 20, 12
2410	DATA	7, 17, 9
2420	DATA	5, 14, 7
2430	DATA	4, 12, 5
2440	DATA	3, 9, 4
2450	DATA	3, 23, 15
2460	DATA	5, 19, 14
2470	DATA	6, 17, 11
2480	DATA	6, 15, 9
2490	DATA	5, 13, 7
2500	DATA	4, 11, 5
2510	DATA	2, 9, 4
2520	DATA	14, 1, 5
2530	DATA	3, 10, 10
2540	DATA	4, 13, 11
2550	DATA	5, 13, 9
2560	DATA	5, 12, 8
2570	DATA	4, 11, 6
2580	DATA	2, 9, 4
2590	DATA	-4, -1, 10
2600	DATA	-2, 1, 10
2610	DATA	2, 6, 10
2620	DATA	5, 9, 10
2630	DATA	5, 11, 8
2640	DATA	5, 10, 7
2650	DATA	3, 9, 5
2660	DATA	0, 1, 13
2670	DATA	0, 2, 13
2680	DATA	1, 4, 12
2690	DATA	4, 6, 11
2700	DATA	5, 8, 9
2710	DATA	5, 9, 8
2720	DATA	4, 9, 6
2730	DATA	

2740	DATA	0,4,17
2750	DATA	1,4,16
2760	DATA	1,5,14
2770	DATA	3,6,12
2780	DATA	5,6,10
2790	DATA	5,8,9
2800	DATA	5,8,7
2810	DATA	1,6,20
2820	DATA	1,6,19
2830	DATA	2,6,16
2840	DATA	3,7,13
2850	DATA	5,7,11
2860	DATA	5,8,9
2870	DATA	5,8,8
2880	DATA	0,8,25
2890	DATA	2,7,22
2900	DATA	4,7,19
2910	DATA	4,7,15
2920	DATA	5,7,12
2930	DATA	6,8,10
2940	DATA	6,8,9
2950	DATA	1,7,31
2960	DATA	2,6,27
2970	DATA	4,6,22
2980	DATA	5,6,17
2990	DATA	6,7,13
3000	DATA	6,8,11
3010	DATA	6,8,9
3020	DATA	6,8,10
5000	HOME	
5100	END	

APPENDIX B

Results of SAP IV Computer  
Program - Before and After  
Firing

1. CENTROID STRESSES REFERENCED TO LOCAL Y-Z COORDINATES  
2. MID-SIDE STRESSES ARE NORMAL AND PARALLEL TO ELEMENT EDGES.

66

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

-22.11  
-3.84  
-27.92  
-34.29  
-78.82-0.10844D 05  
-0.10801D 05  
-0.10887D 05  
-0.10784D 05  
-0.10946D 05-0.10800D 05  
-0.10776D 05  
-0.10820D 05  
-0.10706D 05  
-0.10855D 05-0.15278D 02  
-0.16510D 01  
-0.27906D 02  
-0.36235D 02  
-0.17316D 02-0.10416D 05  
-0.10777D 05  
-0.10835D 05  
-0.10720D 05  
-0.10914D 05-0.10838D 05  
-0.10801D 05  
-0.10873D 05  
-0.10760D 05  
-0.10858D 05-0.10807D 05  
-0.10776D 05  
-0.10835D 05  
-0.10731D 05  
-0.10942D 051 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ELEMENT ( 8 )

ANGLE  
88.95  
73.03  
44.86  
-2.29  
-2.23S-MIN  
-0.97073D 04  
-0.90721D 04  
-0.10467D 05  
-0.89565D 04  
-0.10642D 05S-MAX  
-0.39497D 03  
-0.11898D 04  
-0.20701D 04  
-0.24333D 03  
-0.11625D 04S12  
0.17076D 03  
0.28654D 04  
0.41986D 04  
-0.36683D 03  
-0.36834D 03S33  
-0.95072D 04  
-0.87691D 04  
-0.10265D 05  
-0.87455D 04  
-0.10402D 05S22  
-0.39810D 03  
-0.31519D 03  
-0.62899D 04  
-0.89418D 04  
-0.10627D 05S11  
-0.97042D 04  
-0.81975D 04  
-0.62476D 04  
0.22868D 03  
-0.11768D 041 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ELEMENT ( 9 )

ANGLE  
86.36  
80.96  
81.60  
-2.49  
-2.84S-MIN  
-0.11174D 05  
-0.11046D 05  
-0.11326D 05  
-0.99412D 04  
-0.12458D 05S-MAX  
-0.20518D 03  
-0.11137D 03  
-0.52780D 03  
-0.55295D 03  
-0.99280D 03S12  
0.69543D 03  
0.17316D 04  
0.15600D 04  
-0.45526D 03  
-0.56734D 03S33  
-0.10956D 05  
-0.10809D 05  
-0.11103D 05  
-0.96962D 04  
-0.12270D 05S22  
-0.24945D 03  
-0.16418D 03  
-0.75808D 03  
-0.99214D 04  
-0.12430D 05S11  
-0.11129D 05  
-0.10770D 05  
-0.11096D 05  
-0.53317D 03  
-0.10209D 041 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ELEMENT ( 10 )

ANGLE  
81.39  
74.37  
78.76  
-3.14  
4.20S-MIN  
-0.12970D 05  
-0.12889D 05  
-0.13059D 05  
-0.12916D 05  
-0.13026D 05S-MAX  
-0.21553D 04  
-0.19568D 04  
-0.23730D 04  
-0.20941D 04  
-0.22165D 04S12  
0.16005D 04  
0.14710D 04  
0.20431D 04  
-0.59212D 03  
-0.78994D 03S33  
-0.12741D 05  
-0.12665D 05  
-0.12828D 05  
-0.12725D 05  
-0.12758D 05S22  
-0.23976D 04  
-0.23153D 04  
-0.27791D 04  
-0.12883D 05  
-0.12968D 05S11  
-0.12727D 05  
-0.12531D 05  
-0.12653D 05  
-0.21266D 04  
-0.22746D 041 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ELEMENT ( 11 )

ANGLE  
77.75  
78.13  
75.37  
0.02  
8.35S-MIN  
-0.13219D 05  
-0.13150D 05  
-0.13274D 05  
-0.14703D 05  
-0.11722D 05S-MAX  
-0.56756D 04  
-0.54796D 04  
-0.58521D 04  
-0.64836D 04  
-0.48572D 04S12  
0.15641D 04  
0.15438D 04  
0.18135D 04  
0.33055D 01  
0.98607D 03S33  
-0.13030D 05  
-0.12862D 05  
-0.13145D 05  
-0.14493D 05  
-0.11544D 05S22  
-0.60152D 04  
-0.58040D 04  
-0.62550D 05  
-0.14703D 05  
-0.11577D 05S11  
-0.12879D 05  
-0.12826D 05  
-0.12800D 05  
-0.64836D 04  
-0.50019D 041 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ELEMENT ( 12 )

ANGLE  
76.29  
78.56  
73.47  
9.44  
11.86S-MIN  
-0.12270D 05  
-0.12367D 05  
-0.12144D 05  
-0.13774D 05  
-0.10797D 05S-MAX  
-0.90587D 04  
-0.91715D 04  
-0.88857D 04  
-0.99628D 04  
-0.81387D 04S12  
0.73951D 03  
0.62107D 03  
0.88848D 03  
0.61694D 03  
0.53460D 03S33  
-0.12221D 05  
-0.12162D 05  
-0.12196D 05  
-0.13634D 05  
-0.10809D 05S22  
-0.92391D 04  
-0.92971D 04  
-0.91493D 04  
-0.13671D 05  
-0.10684D 05S11  
-0.12090D 05  
-0.12410D 05  
-0.11880D 05  
-0.10065D 05  
-0.82509D 041 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ELEMENT ( 13 )

ANGLE  
75.41  
80.12  
71.15  
20.77  
12.45S-MIN  
-0.11278D 05  
-0.11348D 05  
-0.11920D 05  
-0.11984D 05  
-0.10619D 05S-MAX  
-0.10496D 05  
-0.10574D 05  
-0.10380D 05  
-0.10932D 05  
-0.10078D 05S12  
0.19050D 03  
0.13091D 03  
0.24818D 03  
0.19359D 03  
0.15248D 03S33  
-0.11298D 05  
-0.11271D 05  
-0.11275D 05  
-0.11971D 05  
-0.10731D 05S22  
-0.10546D 05  
-0.10597D 05  
-0.10465D 05  
-0.11852D 05  
-0.10650D 05S11  
-0.11288D 05  
-0.11326D 05  
-0.11070D 05  
-0.10650D 05  
-0.10078D 051 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L



ELEMENT ( 14 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.10855D 05	-0.10819D 05	-0.10835D 05	-0.64781D 01	-0.10818D 05	-0.10856D 05	-79.98
	1 L-I	-0.10803D 05	-0.10777D 05	-0.10843D 05	-0.16729D 02	-0.10769D 05	-0.10811D 05	-63.71
	1 J-K	-0.10895D 05	-0.10830D 05	-0.10846D 05	-0.28780D 02	-0.10836D 05	-0.10909D 05	-64.13
	1 I-J	-0.10653D 05	-0.10635D 05	-0.10634D 05	-0.33493D 02	-0.10635D 05	-0.10713D 05	-54.26
LOAD LOC	1 K-L	-0.11023D 05	-0.10931D 05	-0.11031D 05	-0.77612D 02	-0.10927D 05	-0.11085D 05	-50.73
ELEMENT ( 15 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.11076D 05	-0.23458D 03	-0.10114D 05	0.28783D 03	-0.22694D 03	-0.11084D 05	88.48
	1 L-I	-0.18318D 04	-0.44347D 04	-0.84343D 04	0.83007D 04	-0.35225D 04	-0.95790D 04	59.12
	1 J-K	-0.68557D 04	-0.10046D 05	-0.11897D 05	0.39699D 04	-0.41475D 04	-0.12754D 05	54.12
	1 I-J	-0.13795D 04	-0.10667D 05	-0.90441D 04	-0.69742D 03	-0.14218D 04	-0.10109D 05	-3.47
LOAD LOC	1 K-L	-0.20741D 04	-0.12184D 05	-0.11319D 05	0.53995D 03	-0.20454D 04	-0.12213D 05	3.05
ELEMENT ( 16 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.12363D 05	-0.64680D 03	-0.11575D 05	0.1386D 04	-0.47204D 03	-0.12537D 05	83.10
	1 L-I	-0.11645D 05	-0.98048D 03	-0.11527D 05	0.2828D 04	-0.2673D 03	-0.12423D 05	75.39
	1 J-K	-0.12039D 05	-0.13269D 04	-0.1177D 05	0.26271D 04	-0.72675D 03	-0.12648D 05	76.82
	1 I-J	-0.14471D 03	-0.11268D 05	-0.10404D 05	-0.10833D 03	-0.24663D 03	-0.11370D 05	-5.37
LOAD LOC	1 K-L	-0.12081D 04	-0.13732D 05	-0.12782D 05	-0.94570D 02	-0.12074D 04	-0.13733D 05	0.43
ELEMENT ( 17 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.13301D 05	-0.31071D 04	-0.13159D 05	0.28814D 04	-0.23491D 04	-0.14059D 05	75.26
	1 L-I	-0.12817D 05	-0.28449D 04	-0.12975D 05	0.3569D 04	-0.18480D 04	-0.13813D 05	73.22
	1 J-K	-0.13234D 05	-0.39718D 04	-0.13424D 05	0.3565D 04	-0.28833D 04	-0.14322D 05	72.03
	1 I-J	-0.26728D 04	-0.14399D 05	-0.1393D 05	-0.17950D 04	-0.24224D 04	-0.14609D 05	-8.57
LOAD LOC	1 K-L	-0.22725D 04	-0.13514D 05	-0.12725D 05	-0.54944D 02	-0.22723D 04	-0.13514D 05	-0.28
ELEMENT ( 18 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.12746D 05	-0.67212D 04	-0.13255D 05	0.24476D 04	-0.57231D 04	-0.13744D 05	69.34
	1 L-I	-0.12553D 05	-0.92257D 04	-0.13943D 05	0.25973D 04	-0.52488D 04	-0.13527D 05	69.94
	1 J-K	-0.12888D 05	-0.73897D 04	-0.13480D 05	0.2737D 04	-0.5213D 04	-0.13993D 05	67.23
	1 I-J	-0.65374D 04	-0.1521D 05	-0.14683D 05	-0.1492D 03	-0.6887D 04	-0.15419D 05	-7.37
LOAD LOC	1 K-L	-0.50691D 04	-0.12088D 05	-0.11629D 05	-0.26188D 03	-0.50593D 04	-0.12098D 05	2.13
ELEMENT ( 19 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.11856D 05	-0.9382D 04	-0.12305D 05	0.13412D 04	-0.87929D 04	-0.12443D 05	66.35
	1 L-I	-0.11917D 05	-0.91634D 04	-0.1222D 05	0.1248D 04	-0.86727D 04	-0.12412D 05	68.72
	1 J-K	-0.1182D 05	-0.95564D 05	-0.12897D 05	0.1389D 04	-0.8978D 04	-0.12481D 05	64.60
	1 I-J	-0.95888D 04	-0.13931D 05	-0.13687D 05	-0.26840D 02	-0.95887D 04	-0.15951D 05	-0.35
LOAD LOC	1 K-L	-0.80595D 04	-0.10963D 05	-0.10949D 05	-0.28078D 03	-0.80326D 04	-0.10990D 05	5.47
ELEMENT ( 20 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
LOAD LOC	1 CEN	-0.11212D 05	-0.10544D 05	-0.11391D 05	0.38272D 03	-0.10384D 05	-0.11390D 05	65.14
	1 L-I	-0.11323D 05	-0.10555D 05	-0.11465D 05	0.3927D 03	-0.10439D 05	-0.11440D 05	70.14
	1 J-K	-0.1114D 05	-0.10580D 05	-0.1182D 05	0.4219D 03	-0.10203D 05	-0.11338D 05	62.30
	1 I-J	-0.10338D 04	-0.12154D 05	-0.12114D 05	-0.25194D 03	-0.10882D 05	-0.12206D 05	11.18

1 CEN -0.10884D 05 -0.10812D 05 -0.10900D 05 0.24372D 02 -0.10805D 05 -0.10891D 05 72.83  
 1 L-I -0.10824D 05 -0.10781D 05 -0.10751D 05 0.47349D 02 -0.10731D 05 -0.10856D 05 57.56  
 1 J-K -0.10934D 05 -0.10832D 05 -0.10832D 05 0.50527D 00 -0.10832D 05 -0.10936D 05 -89.72  
 1 I-J -0.10606D 05 -0.10668D 05 -0.10668D 05 -0.29719D 02 -0.10944D 05 -0.10680D 05 -21.95  
 1 K-L -0.11032D 05 -0.11114D 05 -0.11142D 05 0.99304D 02 -0.10965D 05 -0.11180D 05 33.83

ELEMENT ( 22 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.14005D 05 -0.33300D 03 -0.11472D 05 0.69737D 03 -0.29772D 03 -0.14040D 05 87.09  
 1 L-I -0.40457D 04 -0.70440D 04 -0.89007D 04 0.75189D 04 -0.50710D 04 -0.17100D 05 31.82  
 1 J-K -0.83605D 04 -0.14685D 05 -0.14681D 05 0.40605D 04 -0.63762D 04 -0.16670D 05 26.04  
 1 I-J 0.2606D 04 -0.12887D 05 -0.10059D 05 -0.11378D 04 -0.26538D 04 -0.12700D 05 -1.18  
 1 K-L -0.34686D 04 -0.15199D 05 -0.12991D 05 -0.29315D 03 -0.34613D 04 -0.15206D 05 1.43

ELEMENT ( 23 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.14373D 05 -0.13236D 04 -0.12657D 05 0.26881D 04 -0.79156D 03 -0.14905D 05 78.80  
 1 L-I -0.13132D 05 -0.17825D 04 -0.1227D 05 0.44056D 04 -0.27315D 03 -0.14641D 05 71.09  
 1 J-K -0.13903D 05 -0.25947D 04 -0.1304D 05 0.39833D 04 -0.1325D 04 -0.15165D 05 72.42  
 1 I-J -0.66007D 03 -0.14038D 05 -0.11632D 05 -0.22235D 04 -0.30017D 03 -0.1598D 05 -9.19  
 1 K-L -0.13155D 04 -0.15388D 05 -0.13498D 05 -0.66155D 03 -0.1284D 04 -0.15419D 05 -2.69

ELEMENT ( 24 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.13977D 05 -0.47203D 04 -0.13901D 05 0.44139D 04 -0.29531D 04 -0.13745D 05 68.18  
 1 L-I -0.13255D 05 -0.39790D 04 -0.13433D 05 0.46885D 04 -0.2062D 04 -0.1518D 05 67.41  
 1 J-K -0.14194D 05 -0.60988D 04 -0.14398D 05 0.47527D 04 -0.3241D 04 -0.1636D 05 65.30  
 1 I-J -0.41367D 04 -0.16543D 05 -0.14659D 05 -0.33829D 04 -0.32742D 04 -0.17405D 05 -14.30  
 1 K-L -0.27512D 04 -0.14037D 05 -0.13162D 05 -0.11343D 04 -0.26384D 04 -0.14150D 05 -5.68

ELEMENT ( 25 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.12496D 05 -0.80807D 04 -0.13500D 05 0.35371D 04 -0.61189D 04 -0.14458D 05 60.99  
 1 L-I -0.12233D 05 -0.71402D 04 -0.1324D 05 0.35221D 04 -0.5303D 04 -0.14032D 05 62.93  
 1 J-K -0.12933D 05 -0.89445D 04 -0.13907D 05 0.34716D 04 -0.6900D 04 -0.1457D 05 60.00  
 1 I-J -0.71422D 04 -0.15897D 05 -0.14975D 05 -0.22923D 04 -0.65822D 04 -0.16416D 05 -13.89  
 1 K-L -0.57004D 04 -0.12564D 05 -0.12160D 05 -0.52313D 03 -0.56608D 04 -0.12604D 05 -4.33

ELEMENT ( 26 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11551D 05 -0.99334D 04 -0.12421D 05 0.18071D 04 -0.87625D 04 -0.12722D 05 57.06  
 1 L-I -0.11599D 05 -0.94644D 04 -0.12459D 05 0.17451D 04 -0.84860D 04 -0.12577D 05 60.72  
 1 J-K -0.11752D 05 -0.10181D 04 -0.12568D 05 0.1763D 04 -0.90383D 04 -0.12898D 05 56.99  
 1 I-J -0.94524D 04 -0.14119D 05 -0.13710D 05 -0.66311D 03 -0.9360D 04 -0.14211D 05 -7.93  
 1 K-L -0.81917D 04 -0.11329D 05 -0.11182D 05 -0.11436D 03 -0.81875D 04 -0.11333D 05 -2.09

ELEMENT ( 27 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11077D 05 -0.10694D 05 -0.11463D 05 0.59713D 03 -0.10260D 05 -0.1153D 05 53.84  
 1 L-I -0.11193D 05 -0.10560D 05 -0.11481D 05 0.5445D 03 -0.10247D 05 -0.11507D 05 60.07  
 1 J-K -0.1068D 05 -0.1071D 05 -0.1149D 05 0.61462D 03 -0.1051D 05 -0.1131D 05 53.03  
 1 I-J -0.10744D 05 -0.12390D 05 -0.1233D 05 -0.22987D 02 -0.10744D 05 -0.1290D 05 0.80  
 1 K-L -0.10744D 05 -0.12390D 05 -0.1233D 05 -0.73144D 02 -0.97814D 04 -0.10730D 05 -4.43

ELEMENT ( 28 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10884D 03	-0.10838D 03	-0.10461D 03	0.72824D 02	-0.10784D 03	-0.10937D 03	53.75
1	L-1	-0.10839D 03	-0.10825D 03	-0.10464D 03	0.92247D 02	-0.10739D 03	-0.10924D 03	47.18
1	J-K	-0.10940D 03	-0.10828D 03	-0.10479D 03	0.50179D 02	-0.10809D 03	-0.10959D 03	49.03
1	I-J	-0.10578D 03	-0.10679D 03	-0.10707D 03	-0.45094D 02	-0.10500D 03	-0.10654D 03	-20.83
1	K-L	-0.11000D 03	-0.11230D 03	-0.11232D 03	0.77131D 02	-0.10976D 03	-0.11253D 03	16.93
ELEMENT ( 29 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.19571D 03	-0.36887D 03	-0.13820D 03	0.15346D 04	-0.24700D 03	-0.19693D 03	85.46
1	L-1	-0.16909D 04	-0.10543D 03	-0.10136D 03	0.10189D 03	0.74581D 04	-0.16311D 03	29.51
1	J-K	-0.10922D 03	-0.21749D 03	-0.17932D 03	0.51486D 04	-0.88648D 04	-0.23806D 03	21.78
1	I-J	-0.45345D 04	-0.18864D 03	-0.12054D 03	-0.17412D 04	0.46633D 04	-0.18993D 03	-4.23
1	K-L	-0.49722D 04	-0.20360D 03	-0.15533D 03	-0.46248D 03	-0.49583D 04	-0.20373D 03	-1.72
ELEMENT ( 30 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.17390D 03	-0.32991D 04	-0.14504D 03	0.50939D 04	-0.16467D 04	-0.19002D 03	72.03
1	L-1	-0.19681D 03	-0.33218D 04	-0.13785D 03	0.62141D 04	-0.73767D 03	-0.18265D 03	67.42
1	J-K	-0.17226D 03	-0.51922D 04	-0.15228D 03	0.61863D 04	-0.25794D 04	-0.19839D 03	67.10
1	I-J	-0.32312D 04	-0.19635D 03	-0.14813D 03	-0.45423D 04	-0.20574D 04	-0.20809D 03	-14.49
1	K-L	-0.16254D 04	-0.16991D 03	-0.14255D 03	-0.23314D 04	-0.12793D 04	-0.17337D 03	-8.44
ELEMENT ( 31 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.14398D 03	-0.78171D 04	-0.14943D 03	0.60565D 04	-0.42044D 04	-0.17971D 03	59.18
1	L-1	-0.13557D 03	-0.58327D 04	-0.14135D 03	0.59665D 04	-0.25876D 04	-0.16803D 03	61.46
1	J-K	-0.15614D 03	-0.96202D 04	-0.15832D 03	0.60367D 04	-0.58774D 04	-0.19337D 03	58.20
1	I-J	-0.68333D 04	-0.19128D 03	-0.16399D 03	-0.55337D 04	-0.47093D 04	-0.21252D 03	-21.00
1	K-L	-0.42929D 04	-0.14424D 03	-0.13584D 03	-0.245534D 04	-0.37301D 04	-0.14987D 03	-12.92
ELEMENT ( 32 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.12049D 03	-0.10011D 03	-0.13877D 03	0.40164D 04	-0.68853D 04	-0.15174D 03	52.12
1	L-1	-0.11918D 03	-0.85184D 04	-0.13481D 03	0.39757D 04	-0.58957D 04	-0.14542D 03	56.58
1	J-K	-0.13131D 03	-0.10710D 03	-0.14332D 03	0.38101D 04	-0.92299D 04	-0.15919D 03	53.81
1	I-J	-0.82688D 04	-0.16064D 03	-0.15224D 03	-0.32741D 04	-0.70762D 04	-0.17257D 03	-20.02
1	K-L	-0.69413D 04	-0.13032D 03	-0.12598D 03	-0.12788D 04	-0.66837D 04	-0.13290D 03	-11.39
ELEMENT ( 33 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11214D 03	-0.10761D 03	-0.12555D 03	0.20504D 04	-0.89250D 04	-0.13051D 03	48.15
1	L-1	-0.11347D 03	-0.10017D 03	-0.12397D 03	0.20167D 04	-0.85588D 04	-0.12806D 03	54.13
1	J-K	-0.11747D 03	-0.10890D 03	-0.12732D 03	0.19779D 04	-0.92943D 04	-0.13342D 03	51.11
1	I-J	-0.96663D 04	-0.14163D 03	-0.13724D 03	-0.12150D 04	-0.93590D 04	-0.14471D 03	-14.19
1	K-L	-0.86038D 04	-0.11685D 03	-0.11456D 03	-0.54960D 03	-0.85087D 04	-0.11780D 03	-9.82
ELEMENT ( 34 )		S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10865D 03	-0.10979D 03	-0.11561D 03	0.75203D 03	-0.10168D 03	-0.11676D 03	42.83
1	L-1	-0.11021D 03	-0.10475D 03	-0.11474D 03	0.72437D 03	-0.10168D 03	-0.11676D 03	42.83

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE

1 CEN -0.10820D 05 -0.10700D 05 -0.11000D 05 0.11961D 03 -0.10734D 05 -0.10986D 05 35.80  
 1 L-1 -0.10810D 05 -0.10903D 05 -0.11013D 05 0.14543D 03 -0.10704D 05 -0.11009D 05 36.09  
 1 J-K -0.10880D 05 -0.10842D 05 -0.10981D 05 0.11015D 03 -0.10749D 05 -0.10972D 05 49.92  
 1 I-J -0.10560D 05 -0.10692D 05 -0.10738D 05 -0.98819D 02 -0.10507D 05 -0.10745D 05 -28.10  
 1 K-L -0.10939D 05 -0.11306D 05 -0.11286D 05 -0.35182D 01 -0.10939D 05 -0.11306D 05 -0.55

ELEMENT ( 36 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.30831D 05 -0.58689D 03 -0.18121D 05 0.50251D 04 0.22618D 03 -0.31644D 05 80.81  
 1 L-1 -0.80876D 03 -0.16931D 05 -0.13100D 05 0.16374D 05 0.10561D 05 -0.26683D 05 30.78  
 1 J-K -0.14682D 05 -0.34416D 05 -0.23801D 05 0.10900D 05 -0.98464D 04 -0.39252D 05 23.92  
 1 I-J -0.55696D 04 -0.36567D 05 -0.18028D 05 -0.34512D 04 -0.58504D 04 -0.36848D 05 -4.65  
 1 K-L -0.41718D 04 -0.27539D 05 -0.18176D 05 -0.43276D 04 -0.33961D 04 -0.28314D 05 -10.16

ELEMENT ( 37 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.20871D 05 -0.93651D 04 -0.17717D 05 0.92224D 04 -0.42485D 04 -0.25988D 05 60.98  
 1 L-1 -0.18959D 05 -0.59037D 04 -0.15942D 05 0.85541D 04 -0.16710D 04 -0.23191D 05 63.67  
 1 J-K -0.23954D 05 -0.12229D 05 -0.19642D 05 0.98124D 04 -0.6610D 04 -0.29522D 05 60.43  
 1 I-J -0.10962D 05 -0.30328D 05 -0.20971D 05 -0.97251D 04 -0.69215D 04 -0.34359D 05 -22.56  
 1 K-L -0.37559D 04 -0.17183D 05 -0.14973D 05 -0.52522D 04 -0.19432D 04 -0.18993D 05 -19.02

ELEMENT ( 38 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.13732D 05 -0.12313D 05 -0.15980D 05 0.67511D 04 -0.62341D 04 -0.19811D 05 48.00  
 1 L-1 -0.13425D 05 -0.87178D 04 -0.14959D 05 0.65392D 04 -0.41215D 04 -0.18031D 05 54.90  
 1 J-K -0.16846D 05 -0.13486D 05 -0.17152D 05 0.55752D 04 -0.83779D 04 -0.21950D 05 52.16  
 1 I-J -0.10550D 05 -0.19979D 05 -0.17775D 05 -0.74101D 04 -0.64821D 04 -0.24070D 05 -28.77  
 1 K-L -0.74319D 04 -0.14822D 05 -0.14398D 05 -0.35803D 04 -0.59819D 04 -0.16272D 05 -22.05

ELEMENT ( 39 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11552D 05 -0.12107D 05 -0.14180D 05 0.38187D 04 -0.8008D 04 -0.15458D 05 42.92  
 1 L-1 -0.11830D 05 -0.10173D 05 -0.13745D 05 0.38649D 04 -0.70487D 04 -0.14934D 05 51.05  
 1 J-K -0.13362D 05 -0.12103D 05 -0.14620D 05 0.36954D 04 -0.89839D 04 -0.16481D 05 49.83  
 1 I-J -0.97897D 04 -0.15798D 05 -0.15371D 05 -0.37269D 04 -0.80069D 04 -0.17581D 05 -25.56  
 1 K-L -0.85706D 04 -0.13401D 05 -0.13081D 05 -0.18438D 04 -0.79473D 04 -0.14024D 05 -18.68

ELEMENT ( 40 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.10942D 05 -0.11709D 05 -0.12708D 05 0.19943D 04 -0.92946D 04 -0.13360D 05 39.56  
 1 L-1 -0.11267D 05 -0.10692D 05 -0.12530D 05 0.20465D 04 -0.89129D 04 -0.13045D 05 49.00  
 1 J-K -0.11870D 05 -0.11524D 05 -0.12900D 05 0.20126D 04 -0.97717D 04 -0.13717D 05 47.48  
 1 I-J -0.10195D 05 -0.14077D 05 -0.13753D 05 -0.15940D 04 -0.96248D 04 -0.14648D 05 -19.70  
 1 K-L -0.92576D 04 -0.11973D 05 -0.11751D 05 -0.92176D 03 -0.89742D 04 -0.12256D 05 -17.09

ELEMENT ( 41 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.10640D 05 -0.11362D 05 -0.11601D 05 0.78548D 03 -0.10136D 05 -0.11865D 05 32.66  
 1 L-1 -0.10885D 05 -0.10935D 05 -0.11534D 05 0.82251D 03 -0.10087D 05 -0.11733D 05 44.13  
 1 J-K -0.10948D 05 -0.11244D 05 -0.11653D 05 0.91580D 03 -0.10168D 05 -0.12024D 05 40.40  
 1 I-J -0.10789D 05 -0.12611D 05 -0.12385D 05 -0.55457D 03 -0.10634D 05 -0.12767D 05 -15.66  
 1 K-L -0.92576D 04 -0.10894D 05 -0.10894D 05 -0.54497D 03 -0.94580D 04 -0.11135D 05 -23.84

1000 LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE

ELEMENT ( 43 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 10677D 05  
 -0. 10696D 05  
 -0. 10757D 05  
 -0. 10530D 05  
 -0. 10931D 05

S22  
 -0. 10933D 05  
 -0. 10983D 05  
 -0. 10883D 05  
 -0. 10613D 05  
 -0. 11323D 05

S33  
 -0. 11007D 05  
 -0. 11031D 05  
 -0. 10957D 05  
 -0. 10726D 05  
 -0. 11322D 05

S12  
 0. 11230D 03  
 0. 19771D 03  
 0. 13232D 03  
 -0. 20732D 03  
 -0. 11810D 03

S-MAX  
 -0. 10636D 05  
 -0. 10593D 05  
 -0. 10667D 05  
 -0. 10360D 05  
 -0. 10899D 05

S-MIN  
 -0. 11024D 05  
 -0. 11084D 05  
 -0. 10972D 05  
 -0. 10784D 05  
 -0. 11358D 05

18.95  
27.02  
32.97  
-35.37  
-15.49

ELEMENT ( 44 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 49153D 05  
 -0. 71582D 05  
 -0. 72954D 05  
 -0. 19757D 05  
 -0. 19291D 05

S22  
 -0. 23003D 05  
 -0. 38088D 05  
 -0. 38131D 05  
 -0. 16242D 06  
 -0. 34680D 05

S33  
 -0. 29653D 05  
 -0. 17374D 05  
 -0. 42131D 05  
 -0. 61996D 05  
 -0. 25285D 05

S12  
 0. 21265D 05  
 0. 21306D 05  
 0. 23103D 05  
 -0. 50606D 05  
 -0. 16071D 05

S-MAX  
 -0. 10103D 05  
 -0. 12049D 05  
 -0. 26614D 05  
 -0. 92222D 01  
 -0. 91669D 04

S-MIN  
 -0. 58063D 05  
 -0. 39341D 05  
 -0. 84472D 05  
 -0. 17819D 06  
 -0. 44804D 05

58.76  
28.01  
63.50  
-17.30  
-32.21

ELEMENT ( 45 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 20379D 05  
 -0. 20273D 05  
 -0. 20224D 05  
 -0. 22518D 05  
 -0. 96801D 04

S22  
 -0. 19321D 05  
 -0. 10710D 05  
 -0. 19088D 05  
 -0. 36016D 05  
 -0. 17129D 05

S33  
 -0. 20714D 05  
 -0. 18123D 05  
 -0. 23577D 05  
 -0. 28618D 05  
 -0. 16553D 05

S12  
 0. 11269D 05  
 0. 97432D 05  
 0. 11042D 05  
 -0. 13149D 05  
 -0. 68969D 04

S-MAX  
 -0. 85687D 04  
 -0. 45380D 05  
 -0. 12275D 05  
 -0. 12683D 05  
 -0. 55662D 04

S-MIN  
 -0. 31132D 05  
 -0. 26345D 05  
 -0. 37017D 05  
 -0. 45851D 05  
 -0. 21243D 05

46.34  
58.07  
58.40  
-32.99  
-30.82

ELEMENT ( 46 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 12743D 05  
 -0. 13852D 05  
 -0. 19988D 05  
 -0. 13556D 05  
 -0. 104700 05

S22  
 -0. 19816D 05  
 -0. 12241D 05  
 -0. 14190D 05  
 -0. 18224D 05  
 -0. 15273D 05

S33  
 -0. 16328D 05  
 -0. 15321D 05  
 -0. 17182D 05  
 -0. 18153D 05  
 -0. 15189D 05

S12  
 0. 53949D 04  
 0. 55226D 04  
 0. 54370D 04  
 -0. 60550D 04  
 -0. 38750D 04

S-MAX  
 -0. 86712D 04  
 -0. 7910D 04  
 -0. 98717D 04  
 -0. 90503D 04  
 -0. 83128D 04

S-MIN  
 -0. 19890D 05  
 -0. 18655D 05  
 -0. 21307D 05  
 -0. 23240D 05  
 -0. 17430D 05

37.06  
49.18  
52.08  
-24.30  
-29.11

ELEMENT ( 47 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 11348D 05  
 -0. 12214D 05  
 -0. 13777D 05  
 -0. 11343D 05  
 -0. 10116D 05

S22  
 -0. 13803D 05  
 -0. 11628D 05  
 -0. 12800D 05  
 -0. 15638D 05  
 -0. 13524D 05

S33  
 -0. 14451D 05  
 -0. 14442D 05  
 -0. 14922D 05  
 -0. 15710D 05  
 -0. 13463D 05

S12  
 0. 30294D 04  
 0. 32317D 04  
 0. 32391D 04  
 -0. 36540D 04  
 -0. 20377D 04

S-MAX  
 -0. 93207D 04  
 -0. 86161D 04  
 -0. 10034D 05  
 -0. 94070D 04  
 -0. 91640D 04

S-MIN  
 -0. 15851D 05  
 -0. 15226D 05  
 -0. 16563D 05  
 -0. 17410D 05  
 -0. 14476D 05

34.05  
47.54  
49.21  
-25  
-25

ELEMENT ( 48 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 10851D 05  
 -0. 11452D 05  
 -0. 12125D 05  
 -0. 10927D 05  
 -0. 10055D 05

S22  
 -0. 12529D 05  
 -0. 11337D 05  
 -0. 11915D 05  
 -0. 13863D 05  
 -0. 12144D 05

S33  
 -0. 12872D 05  
 -0. 12714D 05  
 -0. 13043D 05  
 -0. 13794D 05  
 -0. 12046D 05

S12  
 0. 16241D 04  
 0. 18304D 04  
 0. 18333D 04  
 -0. 16701D 04  
 -0. 11172D 04

S-MAX  
 -0. 98621D 04  
 -0. 94473D 05  
 -0. 10174D 05  
 -0. 10172D 05  
 -0. 95661D 04

S-MIN  
 -0. 13518D 05  
 -0. 13209D 05  
 -0. 13867D 05  
 -0. 14618D 05  
 -0. 12629D 05

46.94  
-24.34  
-23.45

ELEMENT ( 49 )  
 LOAD LOC  
 1 CEN  
 1 L-1  
 1 J-K  
 1 J-L  
 1 K-L

S11  
 -0. 10514D 05  
 -0. 10870D 05  
 -0. 11007D 05

S22  
 -0. 11738D 05  
 -0. 11211D 05  
 -0. 11421D 05

S33  
 -0. 11591D 05  
 -0. 11631D 05  
 -0. 11342D 05

S12  
 0. 66286D 03  
 0. 80915D 03  
 0. 97134D 03  
 -0. 73354D 03

S-MAX  
 -0. 10224D 05  
 -0. 10214D 05  
 -0. 10221D 05  
 -0. 10774D 05

S-MIN  
 -0. 12028D 05  
 -0. 11868D 05  
 -0. 12207D 05  
 -0. 12872D 05

23.64  
39.04  
38.98  
-22.25



1 CEN -0.10464D 05 -0.11031D 05 -0.10472D 05 0.27405D 02 -0.10463D 05 -0.11032D 05 2.76  
 1 L-I -0.10464D 05 -0.11007D 05 -0.10473D 05 0.25048D 03 -0.10366D 05 -0.11030D 05 21.34  
 1 J-K -0.10471D 05 -0.10935D 05 -0.10473D 05 0.99717D 02 -0.10555D 05 -0.10961D 05 14.70  
 1 K-L -0.10471D 05 -0.10325D 05 -0.10624D 05 -0.35487D 03 -0.10036D 05 -0.10760D 05 -50.80  
 -0.11038D 05 -0.11291D 05 -0.11372D 05 -0.21168D 03 -0.10918D 05 -0.11411D 05 -29.56

ELEMENT ( 50 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.16488D 05 -0.39538D 05 -0.27296D 05 0.10122D 05 -0.12674D 05 -0.43352D 05 20.65  
 1 L-I -0.34016D 05 -0.3113D 05 -0.35465D 05 0.21700D 05 -0.18546D 05 -0.68583D 05 59.92  
 1 J-K -0.35067D 05 -0.23240D 04 -0.22763D 05 -0.34919D 04 -0.19557D 04 -0.35436D 05 -83.98  
 1 K-L -0.35223D 05 -0.51182D 05 -0.33507D 05 -0.14231D 05 -0.18943D 05 -0.57466D 05 23.81  
 -0.98176D 04 -0.33632D 05 -0.23368D 05 0.54036D 04 -0.86489D 04 -0.34801D 05 12.20

ELEMENT ( 51 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.19909D 05 -0.27630D 05 -0.23817D 05 0.92590D 04 -0.13738D 05 -0.33801D 05 33.68  
 1 L-I -0.12489D 05 -0.24132D 05 -0.28617D 05 0.92782D 04 -0.20260D 05 -0.46361D 05 67.35  
 1 J-K -0.15534D 05 -0.12937D 05 -0.20184D 05 0.99522D 04 -0.5757D 04 -0.26733D 05 54.20  
 1 K-L -0.35306D 05 -0.44124D 05 -0.37874D 05 0.14919D 05 -0.24158D 05 -0.55272D 05 36.77  
 -0.64192D 04 -0.20658D 05 -0.17125D 05 0.25816D 04 -0.59656D 04 -0.21112D 05 9.97

ELEMENT ( 52 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.15002D 05 -0.18440D 05 -0.18264D 05 0.44463D 04 -0.11960D 05 -0.21502D 05 34.37  
 1 L-I -0.21967D 05 -0.12440D 05 -0.19219D 05 0.38219D 04 -0.14328D 05 -0.23879D 05 63.42  
 1 J-K -0.18072D 05 -0.11864D 05 -0.17629D 05 0.41407D 04 -0.97968D 04 -0.20159D 05 63.47  
 1 K-L -0.19967D 05 -0.26239D 05 -0.22710D 05 0.57811D 04 -0.16528D 05 -0.29680D 05 30.74  
 -0.87735D 04 -0.16899D 05 -0.15318D 05 -0.10921D 03 -0.87920D 04 -0.16901D 05 -0.77

ELEMENT ( 53 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.12088D 05 -0.18864D 05 -0.15104D 05 0.23052D 04 -0.10798D 05 -0.16186D 05 29.42  
 1 L-I -0.14595D 05 -0.13154D 05 -0.15128D 05 0.24735D 04 -0.11299D 05 -0.16431D 05 53.12  
 1 J-K -0.12384D 05 -0.12815D 05 -0.15063D 05 0.28804D 04 -0.10205D 05 -0.15941D 05 47.82  
 1 K-L -0.18478D 05 -0.18430D 05 -0.16846D 05 0.90135D 03 -0.12364D 05 -0.18564D 05 8.45  
 -0.93250D 04 -0.14212D 05 -0.13545D 05 -0.29610D 03 -0.93071D 04 -0.14230D 05 -3.45

ELEMENT ( 54 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11204D 05 -0.13159D 05 -0.13281D 05 0.11861D 04 -0.10651D 05 -0.13743D 05 25.05  
 1 L-I -0.12398D 05 -0.11984D 05 -0.13114D 05 0.15059D 04 -0.10627D 05 -0.13655D 05 47.98  
 1 J-K -0.12330D 05 -0.12070D 05 -0.13436D 05 0.15960D 04 -0.10644D 05 -0.13856D 05 48.22  
 1 K-L -0.11446D 05 -0.15089D 05 -0.14420D 05 0.21242D 03 -0.11434D 05 -0.15101D 05 3.33  
 -0.10116D 05 -0.12578D 05 -0.12315D 05 -0.59609D 03 -0.99797D 04 -0.12715D 05 -12.92

ELEMENT ( 55 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.10636D 05 -0.12040D 05 -0.11913D 05 0.44273D 03 -0.10508D 05 -0.12168D 05 16.12  
 1 L-I -0.11209D 05 -0.11303D 05 -0.11835D 05 0.69190D 03 -0.10648D 05 -0.12063D 05 38.99  
 1 J-K -0.11179D 05 -0.11503D 05 -0.11932D 05 0.93812D 03 -0.10365D 05 -0.12277D 05 39.51  
 1 K-L -0.11314D 05 -0.12074D 05 -0.12807D 05 -0.25651D 03 -0.11277D 05 -0.13111D 05 -8.12  
 -0.10255D 05 -0.11034D 05 -0.11149D 05 -0.72849D 03 -0.98188D 04 -0.11471D 05 -30.94

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE

1 CEN -0.10318D 05 -0.11018D 05 -0.10949D 05 -0.15680D 03 -0.1035D 05 -0.11052D 05 -12.06  
 1 L-1 -0.10192D 05 -0.11009D 05 -0.10471D 05 -0.20735D 03 -0.1009D 05 -0.1108D 05 -18.52  
 1 J-K -0.10416D 05 -0.11460D 05 -0.10446D 05 -0.23705D 02 -0.10471D 05 -0.11010D 05 -2.52  
 1 K-L -0.11283D 05 -0.11460D 05 -0.11574D 05 -0.46292D 03 -0.95315D 04 -0.10659D 05 -32.38  
 -0.11283D 05 -0.11460D 05 -0.11574D 05 -0.19552D 03 -0.11117D 05 -0.11366D 05 -32.77

ELEMENT ( 57 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN 0.13991D 04 -0.23471D 05 -0.19863D 05 -0.36523D 03 -0.14044D 04 -0.23477D 05 -0.84  
 1 L-1 -0.22284D 05 -0.29453D 04 -0.17492D 05 -0.14375D 04 -0.30272D 04 -0.23366D 05 -86.75  
 1 J-K -0.15636D 05 -0.88421D 04 -0.22131D 05 -0.1811D 05 -0.5077D 02 -0.24529D 05 -53.02  
 1 K-L 0.13905D 04 -0.23264D 05 -0.19982D 05 -0.37865D 03 -0.13963D 04 -0.2369D 05 -0.88  
 0.13775D 04 -0.23619D 05 -0.19738D 05 -0.10105D 04 -0.14183D 04 -0.23659D 05 -2.51

ELEMENT ( 58 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.77373D 04 -0.24260D 05 -0.21232D 05 -0.46132D 04 -0.67344D 04 -0.23460D 05 -14.59  
 1 L-1 -0.22135D 05 -0.40174D 05 -0.21232D 05 -0.83834D 04 -0.87672D 04 -0.27106D 05 -57.96  
 1 J-K -0.19688D 05 -0.93510D 04 -0.22135D 05 -0.85994D 04 -0.44864D 04 -0.2453D 05 -60.50  
 1 K-L -0.10372D 05 -0.28457D 05 -0.24582D 05 -0.48413D 04 -0.91578D 05 -0.29671D 05 -14.08  
 -0.42912D 04 -0.21873D 05 -0.18825D 05 -0.11764D 04 -0.42128D 04 -0.21931D 05 -3.81

ELEMENT ( 59 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.14036D 05 -0.20180D 05 -0.19969D 05 -0.20432D 04 -0.11203D 05 -0.23013D 05 -29.33  
 1 L-1 -0.2707D 05 -0.15593D 05 -0.21340D 05 -0.24214D 04 -0.15100D 05 -0.2763D 05 -78.54  
 1 J-K -0.15842D 05 -0.9634D 05 -0.18584D 05 -0.60637D 04 -0.61824D 04 -0.19843D 05 -57.93  
 1 K-L -0.14998D 05 -0.28130D 05 -0.25093D 05 -0.64833D 04 -0.16042D 05 -0.31586D 05 -28.13  
 -0.64868D 04 -0.15388D 05 -0.15256D 05 -0.16215D 04 -0.62007D 04 -0.15674D 05 -10.01

ELEMENT ( 60 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.13578D 05 -0.15788D 05 -0.16571D 05 -0.24914D 04 -0.11988D 05 -0.17408D 05 -32.04  
 1 L-1 -0.19479D 05 -0.15224D 05 -0.17569D 05 -0.14340D 04 -0.1482D 05 -0.19200D 05 -72.43  
 1 J-K -0.14470D 05 -0.1021D 05 -0.15497D 05 -0.28365D 04 -0.94234D 04 -0.1688D 05 -60.64  
 1 K-L -0.18252D 05 -0.20237D 05 -0.20107D 05 -0.36107D 04 -0.15497D 05 -0.22589D 05 -37.51  
 -0.89068D 04 -0.13955D 05 -0.13873D 05 -0.20572D 03 -0.88984D 04 -0.13964D 05 -2.53

ELEMENT ( 61 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.12226D 05 -0.13511D 05 -0.14080D 05 -0.10019D 04 -0.11678D 05 -0.14059D 05 -28.67  
 1 L-1 -0.13992D 05 -0.12713D 05 -0.14080D 05 -0.7689D 03 -0.1232D 05 -0.1432D 05 -64.89  
 1 J-K -0.13051D 05 -0.1843D 05 -0.15497D 05 -0.12983D 04 -0.1013D 05 -0.12879D 05 -97.47  
 1 K-L -0.13321D 05 -0.15777D 05 -0.15697D 05 -0.8162D 03 -0.13074D 05 -0.16024D 05 -16.81  
 -0.10463D 05 -0.12490D 05 -0.12702D 05 -0.48273D 03 -0.10334D 05 -0.12594D 05 -12.73

ELEMENT ( 62 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11171D 05 -0.12111D 05 -0.12334D 05 -0.25501D 03 -0.11106D 05 -0.12176D 05 -14.24  
 1 L-1 -0.11763D 05 -0.11758D 05 -0.12340D 05 -0.37694D 05 -0.11384D 05 -0.12137D 05 -45.17  
 1 J-K -0.11941D 05 -0.11528D 05 -0.12418D 05 -0.6839D 03 -0.10890D 05 -0.1218D 05 -45.27  
 1 K-L -0.11972D 05 -0.13115D 05 -0.13346D 05 -0.40174D 04 -0.1171D 05 -0.13116D 05 -2.03  
 -0.10667D 05 -0.11106D 05 -0.12702D 05 -0.40174D 04 -0.1171D 05 -0.13116D 05 -2.03

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE

ELEMENT ( 64 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.10346D 03 -0.10884D 03 -0.11037D 03 -0.25180D 03 -0.10189D 03 -0.11043D 03 -26.77  
 1 L-1 -0.10058D 03 -0.10977D 03 -0.11047D 03 -0.26055D 03 -0.99910D 04 -0.11044D 03 -14.22  
 1 J-K -0.10381D 03 -0.11084D 03 -0.11037D 03 -0.18371D 03 -0.10334D 03 -0.11130D 03 -13.94  
 1 I-J -0.10431D 03 -0.10804D 04 -0.10371D 03 -0.39479D 03 -0.91379D 04 -0.10533D 03 -72.77  
 1 K-L -0.11601D 03 -0.11489D 03 -0.11644D 03 -0.11444D 03 -0.11418D 03 -0.11673D 03 -58.02

ELEMENT ( 65 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.93722D 03 -0.19010D 03 -0.22444D 03 -0.23422D 03 -0.53425D 03 -0.19013D 03 0.73  
 1 L-1 -0.12656D 03 -0.80323D 04 -0.11344D 03 -0.78940D 04 -0.24859D 03 -0.19263D 03 -0.73  
 1 J-K -0.12240D 03 -0.60351D 04 -0.23358D 03 -0.92780D 04 -0.70987D 03 -0.19053D 03 -54.19  
 1 I-J -0.40261D 03 -0.18788D 03 -0.22531D 03 -0.35811D 03 -0.39617D 03 -0.18983D 03 -1.07  
 1 K-L -0.69254D 03 -0.19028D 03 -0.22266D 03 -0.57079D 03 -0.67479D 03 -0.19048D 03 -1.78

ELEMENT ( 66 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.15324D 04 -0.19428D 03 -0.21379D 03 -0.93682D 03 -0.14835D 04 -0.19477D 03 2.99  
 1 L-1 -0.10770D 03 -0.54374D 04 -0.18449D 03 -0.92799D 04 -0.14246D 04 -0.17832D 03 52.73  
 1 J-K -0.17820D 03 -0.71251D 04 -0.24119D 03 -0.65352D 04 -0.39573D 04 -0.20990D 03 64.41  
 1 I-J -0.15232D 04 -0.19370D 03 -0.24088D 03 -0.39009D 02 -0.15231D 04 -0.19370D 03 -0.11  
 1 K-L -0.14690D 04 -0.19557D 03 -0.20226D 03 -0.74299D 03 -0.14385D 04 -0.19587D 03 -2.35

ELEMENT ( 67 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.70842D 04 -0.19097D 03 -0.20048D 03 -0.30726D 04 -0.63458D 04 -0.19837D 03 13.55  
 1 L-1 -0.14123D 03 -0.10080D 03 -0.18700D 03 -0.59601D 04 -0.64191D 04 -0.19783D 03 58.44  
 1 J-K -0.17451D 03 -0.14040D 03 -0.21414D 03 -0.63473D 04 -0.62537D 04 -0.20111D 03 56.82  
 1 I-J -0.87450D 04 -0.22358D 03 -0.23233D 03 -0.23387D 04 -0.83783D 04 -0.22944D 03 9.37  
 1 K-L -0.44720D 04 -0.17059D 03 -0.17157D 03 -0.11841D 03 -0.47709D 04 -0.17060D 03 -0.54

ELEMENT ( 68 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11842D 03 -0.16215D 03 -0.17675D 03 -0.28974D 04 -0.10414D 03 -0.17663D 03 13.55  
 1 L-1 -0.18320D 03 -0.12449D 03 -0.17619D 03 -0.18919D 04 -0.12082D 03 -0.18959D 03 58.44  
 1 J-K -0.15058D 03 -0.10571D 03 -0.17838D 03 -0.34404D 04 -0.87073D 04 -0.16924 27.97  
 1 I-J -0.14300D 03 -0.21198D 03 -0.21303D 03 -0.20232D 04 -0.13344D 03 -0.22365D 03 9.37  
 1 K-L -0.75775D 04 -0.13749D 03 -0.14463D 03 -0.12751D 03 -0.75749D 04 -0.13752D 03 -0.54

ELEMENT ( 69 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.12730D 03 -0.13441D 03 -0.14977D 03 -0.13072D 04 -0.11731D 03 -0.14440D 03 13.55  
 1 L-1 -0.15217D 03 -0.12739D 03 -0.14991D 03 -0.18999D 03 -0.12724D 03 -0.15231D 03 58.44  
 1 J-K -0.13520D 03 -0.11170D 03 -0.15000D 03 -0.11304D 04 -0.10669D 03 -0.13968D 03 27.97  
 1 I-J -0.14282D 03 -0.16514D 03 -0.17228D 03 -0.16094D 04 -0.13440D 03 -0.17356D 03 9.37  
 1 K-L -0.10018D 03 -0.12130D 03 -0.13012D 03 -0.21566D 03 -0.99963D 04 -0.12152D 03 -0.54

ELEMENT ( 70 )  
 LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.11897D 03 -0.11851D 03 -0.12894D 03 -0.29680D 03 -0.11976D 03 -0.12175 13.55  
 1 L-1 -0.12443D 03 -0.11899D 03 -0.12790D 03 -0.14071D 03 -0.11854D 03 -0.12477D 03 58.44  
 1 J-K -0.11944D 03 -0.11271D 03 -0.12997D 03 -0.25126D 03 -0.11188D 03 -0.12036D 03 27.97  
 1 I-J -0.12670D 03 -0.13226D 03 -0.14106D 03 -0.54522D 03 -0.12336D 03 -0.13968D 03 9.37  
 1 K-L -0.10799D 03 -0.11090D 03 -0.11845D 03 -0.17262D 03 -0.10719D 03 -0.11171 0.54



LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10692D 03	-0.10672D 03	-0.11709D 03	-0.40489D 03	-0.10277D 03	-0.11087D 03	-83.7
1	L-I	-0.10172D 03	-0.10921D 03	-0.11346D 03	-0.75572D 02	-0.10164D 03	-0.10928D 03	68.73
1	J-K	-0.10489D 03	-0.11172D 03	-0.11226D 03	-0.38704D 03	-0.10314D 03	-0.11347D 03	
1	K-L	-0.10447D 03	-0.91413D 04	-0.10424D 03	-0.15367D 03	-0.91235D 04	-0.10465D 03	
1	K-L	-0.11881D 03	-0.11539D 03	-0.12289D 03	-0.15691D 03	-0.11478D 03	-0.11942D 03	
ELEMENT ( 71 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.64851D 03	-0.18036D 03	-0.25910D 03	-0.13142D 03	-0.64752D 03	-0.18037D 03	-0.43
1	L-I	-0.12108D 03	-0.59861D 04	-0.23765D 03	-0.77925D 04	-0.67475D 03	-0.17419D 03	-55.72
1	J-K	-0.16135D 03	-0.34428D 04	-0.28136D 03	-0.63150D 04	-0.83608D 03	-0.18742D 03	-67.57
1	J-K	-0.82814D 03	-0.18255D 03	-0.26484D 03	-0.94573D 02	-0.82763D 03	-0.18255D 03	-0.31
1	K-L	-0.50455D 03	-0.17803D 03	-0.25359D 03	-0.67054D 03	-0.47860D 03	-0.17829D 03	-2.22
ELEMENT ( 72 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.16923D 04	-0.17920D 03	-0.24217D 03	-0.13487D 03	-0.16912D 04	-0.17921D 03	-0.3
1	L-I	-0.12632D 03	-0.49802D 04	-0.21977D 03	-0.72195D 04	-0.63556D 03	-0.16977D 03	3.3
1	J-K	-0.14951D 03	-0.6582D 04	-0.26413D 03	-0.68843D 04	-0.27052D 04	-0.18844D 03	60.24
1	J-K	-0.24771D 04	-0.18618D 03	-0.26172D 03	-0.63141D 03	-0.24923D 04	-0.18641D 03	-2.48
1	K-L	-0.11401D 04	-0.17113D 03	-0.22412D 03	-0.13468D 04	-0.99163D 03	-0.17262D 03	
ELEMENT ( 73 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.43428D 04	-0.17529D 03	-0.21429D 03	-0.68717D 03	-0.43070D 04	-0.17565D 03	2.98
1	L-I	-0.11078D 03	-0.83711D 04	-0.14394D 03	-0.66718D 04	-0.29168D 04	-0.16532D 03	50
1	J-K	-0.13621D 03	-0.10486D 03	-0.23370D 03	-0.62885D 04	-0.5723D 04	-0.18534D 03	
1	J-K	-0.53050D 04	-0.18829D 03	-0.24129D 03	-0.52930D 03	-0.52843D 04	-0.18850D 03	-2.24
1	K-L	-0.36311D 04	-0.16212D 03	-0.19011D 03	-0.15591D 04	-0.34408D 04	-0.16403D 03	-6.96
ELEMENT ( 74 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.87732D 04	-0.15890D 03	-0.18553D 03	-0.18050D 04	-0.83416D 04	-0.16321D 03	13.45
1	L-I	-0.14146D 03	-0.10191D 03	-0.17460D 03	-0.33358D 04	-0.82907D 04	-0.16046D 03	60.33
1	J-K	-0.10150D 03	-0.11030D 03	-0.19617D 03	-0.38843D 04	-0.83609D 04	-0.16683D 03	55.51
1	J-K	-0.10374D 03	-0.18986D 03	-0.21790D 03	-0.93904D 03	-0.10273D 03	-0.19087D 03	6.15
1	K-L	-0.66512D 04	-0.13738D 03	-0.15673D 03	-0.83157D 03	-0.65549D 04	-0.13835D 03	-6.60
ELEMENT ( 75 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11838D 03	-0.13308D 03	-0.15797D 03	-0.14788D 04	-0.10921D 03	-0.14224D 03	31.79
1	L-I	-0.14337D 03	-0.11539D 03	-0.15423D 03	-0.47030D 03	-0.11467D 03	-0.14609D 03	81.29
1	J-K	-0.13531D 03	-0.15844D 03	-0.16178D 03	-0.12575D 03	-0.10335D 03	-0.14040D 03	68.24
1	J-K	-0.13224D 03	-0.16443D 03	-0.18381D 03	-0.14580D 04	-0.12661D 03	-0.17005D 03	21.09
1	K-L	-0.92512D 04	-0.11823D 03	-0.13516D 03	-0.15325D 03	-0.92421D 04	-0.11832D 03	-3.40
ELEMENT ( 76 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.12346D 03	-0.11475D 03	-0.13720D 03	-0.56745D 03	-0.11174D 03	-0.12546D 03	62.10
1	L-I	-0.12760D 03	-0.11040D 03	-0.13730D 03	-0.50861D 03	-0.11412D 03	-0.12952D 03	-69.33
1	J-K	-0.12670D 03	-0.10955D 03	-0.13711D 03	-0.10464D 03	-0.10887D 03	-0.12275D 03	-85.66
1	J-K	-0.12810D 03	-0.13300D 03	-0.14940D 03	-0.16607D 04	-0.11979D 03	-0.14152D 03	38.77
1	K-L	-0.10538D 03	-0.11042D 03	-0.12736D 03	-0.22131D 03	-0.10455D 03	-0.11125D 03	20.65

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

-72.53  
-29.63  
-35.66  
81.70  
53.91

-0.11224D 05  
-0.10904D 05  
-0.11581D 05  
-0.10438D 05  
-0.12335D 05

-0.10434D 05  
-0.10450D 05  
-0.10417D 05  
-0.09088D 04  
-0.11259D 05

-0.22624D 03  
-0.19519D 03  
-0.35104D 03  
-0.13276D 03  
-0.31196D 03

-0.11723D 05  
-0.11847D 05  
-0.11610D 05  
-0.10780D 05  
-0.12626D 05

-0.10505D 05  
-0.10730D 05  
-0.11185D 05  
-0.09582D 04  
-0.11633D 05

-0.11153D 05  
-0.10561D 05  
-0.10813D 05  
-0.10419D 05  
-0.11962D 05

ELEMENT ( 78 )

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

-1.19  
-65.33  
87.17  
-1.21  
-2.48

-0.19203D 05  
-0.17797D 05  
-0.20694D 05  
-0.20011D 05  
-0.18394D 05

-0.89678D 03  
-0.34211D 03  
-0.20964D 04  
-0.14811D 04  
-0.32358D 03

-0.37871D 03  
-0.68799D 04  
-0.16566D 03  
-0.39106D 03  
-0.78268D 03

-0.31043D 05  
-0.35120D 05  
-0.35733D 05  
-0.32543D 05  
-0.29869D 05

-0.19195D 05  
-0.28160D 04  
-0.21417D 04  
-0.20002D 05  
-0.18360D 05

-0.90462D 03  
-0.14637D 05  
-0.20649D 05  
-0.14893D 04  
-0.35733D 03

ELEMENT ( 79 )

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

-1.81  
-61.43  
53.52  
-2.18  
-6.80

-0.17996D 05  
-0.17467D 05  
-0.18637D 05  
-0.18534D 05  
-0.16226D 05

-0.21950D 04  
-0.25863D 04  
-0.17190D 04  
-0.39012D 03  
-0.36237D 03

-0.49929D 03  
-0.61236D 04  
-0.60886D 04  
-0.60751D 03  
-0.18426D 04

-0.28229D 05  
-0.28064D 05  
-0.30460D 05  
-0.31340D 05  
-0.23347D 05

-0.17880D 05  
-0.62079D 04  
-0.76599D 05  
-0.19831D 05  
-0.16006D 05

-0.22108D 04  
-0.14133D 05  
-0.12658D 05  
-0.39244D 04  
-0.78220D 03

ELEMENT ( 80 )

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

-1.37  
-49.52  
47.56  
-4.23  
-11.14

-0.16551D 05  
-0.15994D 05  
-0.17134D 05  
-0.18499D 05  
-0.14776D 05

-0.46741D 04  
-0.47824D 04  
-0.46738D 04  
-0.66102D 04  
-0.28927D 04

-0.28373D 03  
-0.53363D 04  
-0.62047D 04  
-0.87477D 03  
-0.22522D 04

-0.24113D 05  
-0.23398D 05  
-0.23823D 05  
-0.27777D 05  
-0.20845D 05

-0.16444D 05  
-0.45579D 04  
-0.10420D 05  
-0.18335D 05  
-0.14332D 05

-0.46809D 04  
-0.11268D 05  
-0.11466D 05  
-0.66748D 04  
-0.33362D 04

ELEMENT ( 81 )

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

4.86  
52.36  
50.28  
-1.87  
-12.17

-0.14907D 05  
-0.14423D 05  
-0.15364D 05  
-0.16862D 05  
-0.13157D 05

-0.76691D 04  
-0.75837D 04  
-0.77841D 04  
-0.94565D 04  
-0.60507D 04

-0.61132D 03  
-0.33220D 04  
-0.32259D 04  
-0.24110D 03  
-0.14646D 04

-0.19980D 05  
-0.18799D 05  
-0.17184D 05  
-0.23371D 05  
-0.17017D 05

-0.14955D 05  
-0.10460D 05  
-0.10879D 05  
-0.16840D 05  
-0.12841D 05

-0.77211D 04  
-0.11591D 05  
-0.12268D 05  
-0.94644D 04  
-0.63666D 04

ELEMENT ( 82 )

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

24.92  
74.09  
46.00  
15.16  
-5.37

-0.13322D 05  
-0.13324D 05  
-0.13387D 05  
-0.15407D 05  
-0.11488D 05

-0.10171D 05  
-0.10450D 05  
-0.99054D 04  
-0.11752D 05  
-0.86827D 04

-0.12040D 04  
-0.75743D 03  
-0.12938D 03  
-0.92240D 03  
-0.26126D 03

-0.16630D 05  
-0.16030D 05  
-0.17410D 05  
-0.19329D 05  
-0.14267D 05

-0.12763D 05  
-0.10488D 05  
-0.10487D 05  
-0.15747D 05  
-0.11463D 05

-0.10730D 05  
-0.12101D 05  
-0.12841D 05  
-0.12005D 05  
-0.87073D 04

ELEMENT ( 83 )

ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

60.44  
-70.72  
-81.41  
-140.24  
39.61

-0.12559D 05  
-0.12860D 05  
-0.12348D 05  
-0.14092D 05  
-0.11488D 05

-0.10590D 05  
-0.10828D 05  
-0.10341D 05  
-0.11407D 05  
-0.11407D 05

-0.84514D 03  
-0.63348D 03  
-0.13743D 03  
-0.17153D 04  
-0.17153D 04

-0.14142D 05  
-0.13864D 05  
-0.14130D 05  
-0.15823D 05  
-0.15823D 05

-0.11049D 05  
-0.11049D 05  
-0.10329D 05  
-0.13018D 05  
-0.13018D 05

-0.12080D 05  
-0.12580D 05  
-0.12300D 05  
-0.12482D 05  
-0.12482D 05

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
ELEMENT ( 85 )								
1	CEN	-0.11537D 05	-0.10480D 05	-0.12301D 05	0.12332D 03	-0.10466D 05	-0.11522D 05	83.44
1	L-1	-0.11106D 05	-0.10608D 05	-0.12434D 05	-0.42771D 03	-0.10350D 05	-0.11535D 05	-80.05
1	J-K	-0.11272D 05	-0.11089D 05	-0.12141D 05	-0.61819D 03	-0.10535D 05	-0.11805D 05	-49.22
1	I-J	-0.10341D 05	-0.10319D 05	-0.11344D 05	0.31027D 03	-0.10019D 05	-0.10640D 05	46.02
1	K-L	-0.11812D 05	-0.11730D 05	-0.13414D 05	0.80905D 03	-0.10931D 05	-0.12981D 05	46.45
ELEMENT ( 86 )								
1	CEN	-0.71343D 02	-0.19838D 05	-0.38262D 05	-0.35326D 03	-0.64922D 02	-0.19844D 05	-1.03
1	L-1	-0.18577D 05	-0.12868D 04	-0.33717D 05	-0.22855D 04	-0.98876D 03	-0.18877D 05	-82.58
1	J-K	-0.15481D 05	-0.52396D 04	-0.44020D 05	-0.99022D 04	-0.78921D 03	-0.21310D 05	58.67
1	I-J	-0.13700D 04	-0.21617D 05	-0.41156D 05	-0.16159D 03	-0.13687D 04	-0.21618D 05	-0.46
1	K-L	0.11871D 04	-0.18010D 05	-0.36451D 05	-0.93916D 03	0.12329D 04	-0.18036D 05	-2.79
ELEMENT ( 87 )								
1	CEN	-0.26447D 04	-0.17635D 05	-0.34297D 05	-0.11947D 03	-0.26438D 04	-0.17636D 05	-0.45
1	L-1	-0.15400D 05	-0.89575D 04	-0.31600D 05	0.47780D 04	-0.83420D 04	-0.17850D 05	62.22
1	J-K	-0.93200D 04	-0.77836D 04	-0.37236D 05	0.90842D 04	0.46837D 03	-0.17584D 05	47.75
1	I-J	-0.59542D 04	-0.20935D 05	-0.39356D 05	0.28051D 03	-0.59489D 04	-0.20960D 05	1.07
1	K-L	0.42157D 03	-0.14269D 05	-0.29568D 05	-0.17634D 04	0.63027D 03	-0.14478D 05	-6.75
ELEMENT ( 88 )								
1	CEN	-0.55787D 04	-0.15080D 05	-0.28038D 05	0.13511D 03	-0.55788D 04	-0.15081D 05	0.81
1	L-1	-0.12793D 05	-0.10901D 05	-0.26374D 05	0.33666D 04	-0.83498D 04	-0.13244D 05	52.85
1	J-K	-0.96719D 04	-0.86063D 04	-0.24806D 05	0.58384D 04	-0.32465D 04	-0.15022D 05	47.61
1	I-J	-0.92905D 04	-0.18272D 05	-0.33573D 05	0.26437D 03	-0.92877D 04	-0.18280D 05	-1.68
1	K-L	-0.23265D 04	-0.11851D 05	-0.23072D 05	-0.18711D 04	-0.19721D 04	-0.12206D 05	-10.72
ELEMENT ( 89 )								
1	CEN	-0.79676D 04	-0.13028D 05	-0.22049D 05	0.70805D 03	-0.78704D 04	-0.13126D 05	7.82
1	L-1	-0.12039D 05	-0.10786D 05	-0.21090D 05	0.17959D 04	-0.95094D 04	-0.13219D 05	54.61
1	J-K	-0.10800D 05	-0.87224D 05	-0.23090D 05	0.30935D 04	-0.64971D 04	-0.13025D 05	54.28
1	I-J	-0.10822D 05	-0.15349D 05	-0.26574D 05	0.56165D 03	-0.10753D 04	-0.15418D 05	-6.97
1	K-L	-0.53283D 04	-0.10499D 05	-0.18156D 05	-0.11325D 04	-0.51094D 04	-0.11188D 05	-10.94
ELEMENT ( 89 )								
1	CEN	-0.10121D 05	-0.11532D 05	-0.17616D 05	0.13080D 04	-0.93403D 04	-0.12313D 05	30.83
1	L-1	-0.12520D 05	-0.10360D 05	-0.17121D 05	0.31357D 03	-0.10318D 05	-0.12565D 05	51.90
1	J-K	-0.11495D 05	-0.87802D 04	-0.18123D 05	0.10144D 04	-0.84749D 04	-0.12151D 05	73.25
1	I-J	-0.11737D 05	-0.13604D 05	-0.20797D 05	0.13236D 04	-0.11031D 05	-0.14570D 05	27.41
1	K-L	-0.76174D 04	-0.10727D 05	-0.14683D 05	-0.88734D 02	-0.76149D 04	-0.10729D 05	-1.63

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11671D 03	-0.10586D 03	-0.12034D 03	0.56240D 03	-0.10347D 03	-0.11910D 03	66.98
1	L-I	-0.11638D 03	-0.10233D 03	-0.12013D 03	-0.50125D 03	-0.10082D 03	-0.11802D 03	-72.15
1	J-K	-0.11791D 03	-0.10632D 03	-0.12432D 03	-0.55532D 03	-0.10628D 03	-0.12027D 03	-64.48
1	I-J	-0.10128D 03	-0.11183D 03	-0.11732D 03	0.26067D 03	-0.10067D 03	-0.11244D 03	13.15
1	K-L	-0.11480D 03	-0.11187D 03	-0.14010D 03	0.10075D 04	-0.10648D 03	-0.12703D 03	39.50
ELEMENT ( 92)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11732D 04	-0.14819D 03	-0.52412D 03	0.89338D 03	-0.11149D 04	-0.14878D 03	3.73
1	L-I	-0.36980D 04	-0.17206D 03	-0.58818D 03	0.12740D 04	-0.3789D 04	-0.17325D 03	5.34
1	J-K	0.13320D 04	-0.12487D 03	-0.48197D 03	0.2306D 03	-0.13366D 04	-0.12491D 03	1.05
1	I-J	-0.78784D 04	-0.82399D 04	-0.62182D 03	0.90157D 04	0.96034D 03	-0.17075D 03	44.43
1	K-L	-0.13063D 03	-0.42918D 04	-0.43039D 03	0.19526D 04	-0.38770D 04	-0.13484D 03	78.01
ELEMENT ( 93)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.38374D 04	-0.12709D 03	-0.44410D 03	0.18896D 04	-0.38517D 04	-0.12095D 03	11.54
1	L-I	-0.92016D 04	-0.16800D 03	-0.52543D 03	0.25878D 04	-0.80866D 04	-0.17825D 03	17.08
1	J-K	0.15193D 04	-0.90133D 04	-0.36994D 03	0.45034D 03	0.1385D 04	-0.15345D 04	2.44
1	I-J	-0.75589D 04	-0.37550D 04	-0.50177D 03	0.71789D 04	0.17696D 04	-0.13083D 03	32.42
1	K-L	-0.13835D 03	-0.95977D 04	-0.39022D 03	0.88608D 03	-0.94199D 04	-0.14013D 03	78.65
ELEMENT ( 94)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.63023D 04	-0.10593D 03	-0.34138D 03	0.28210D 04	-0.49035D 04	-0.11992D 03	26.37
1	L-I	-0.12541D 03	-0.14810D 03	-0.42791D 03	0.36874D 04	-0.98172D 04	-0.17533D 03	36.45
1	J-K	0.38416D 03	-0.75075D 04	-0.26492D 03	0.91615D 03	0.48912D 03	-0.76124D 04	6.54
1	I-J	-0.85237D 04	-0.14708D 04	-0.36736D 03	0.45374D 04	0.74935D 03	-0.10744D 03	63.93
1	K-L	-0.14563D 03	-0.10632D 03	-0.31828D 03	-0.76307D 03	-0.10508D 03	-0.14707D 03	-79.34
ELEMENT ( 95)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.80793D 04	-0.93909D 04	-0.25130D 03	0.30512D 04	-0.56916D 04	-0.11979D 03	38.04
1	L-I	-0.13011D 03	-0.13026D 03	-0.32015D 03	0.39260D 04	-0.90926D 04	-0.15945D 03	44.95
1	J-K	-0.17922D 04	-0.81794D 04	-0.19164D 03	0.10173D 03	-0.14409D 04	-0.83377D 04	8.84
1	I-J	-0.77483D 04	-0.20921D 04	-0.25964D 03	0.22838D 04	-0.14770D 04	-0.10563D 03	74.92
1	K-L	-0.14137D 03	-0.10115D 03	-0.24471D 03	-0.10887D 04	-0.98484D 04	-0.14403D 03	-76.01
ELEMENT ( 96)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.93899D 04	-0.92189D 04	-0.18835D 03	0.27626D 04	-0.66910D 04	-0.12318D 03	44.33
1	L-I	-0.12048D 03	-0.12401D 03	-0.23092D 03	0.35032D 04	-0.87118D 04	-0.15737D 03	43.56
1	J-K	-0.43522D 04	-0.95198D 04	-0.14977D 03	0.74185D 03	-0.42478D 04	-0.92422D 03	8.01
1	I-J	-0.11121D 03	-0.42823D 04	-0.18963D 03	-0.81500D 03	-0.41865D 04	-0.1217D 03	83.30
1	K-L	-0.13476D 03	-0.94596D 04	-0.18798D 03	-0.82011D 03	-0.92955D 04	-0.13637D 03	-78.89
ELEMENT ( 97)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10765D 03	-0.99716D 04	-0.15242D 03	0.20327D 04	-0.82973D 04	-0.12440D 03	50.52
1	L-I	-0.11276D 03	-0.12375D 04	-0.17783D 03	0.25190D 03	-0.92473D 04	-0.14404D 03	38.84
					0.41344D 03	-0.72044D 04	-0.10925D 03	-6.42

# ELEMENT ( 98)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11334D 05	-0.11100D 05	-0.13249D 05	0.79112D 03	-0.10418D 05	-0.12017D 05	49.21
1	L-I	-0.11682D 05	-0.10840D 05	-0.13175D 05	-0.67996D 03	-0.10461D 05	-0.12061D 05	-60.88
1	J-K	-0.11964D 05	-0.10379D 05	-0.13158D 05	-0.10774D 03	-0.10372D 05	-0.11771D 05	-86.13
1	I-J	-0.10080D 05	-0.11662D 05	-0.12429D 05	0.11712D 03	-0.10071D 05	-0.11671D 05	4.21

# ELEMENT ( 99)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11813D 05	-0.10825D 05	-0.13894D 05	0.11014D 04	-0.10112D 05	-0.12526D 05	57.25
1	L-I	-0.10850D 05	-0.12371D 05	-0.14601D 05	0.93722D 03	-0.10404D 05	-0.12818D 05	25.02
1	J-K	-0.11389D 05	-0.10732D 05	-0.13235D 05	-0.11600D 04	-0.98484D 04	-0.12622D 05	-93.02
1	I-J	-0.12317D 05	-0.10114D 05	-0.13643D 05	-0.49374D 03	-0.10009D 05	-0.12423D 05	-77.93

# STATIC SOLUTION TIME LOG

EQUATION SOLUTION = 0.0  
 DISPLACEMENT OUTPUT = 0.0  
 STRESS RECOVERY = 0.0

# TWO-DIMENSIONAL FINITE ELEMENTS (AFTER FIRING)

1. CENTROID STRESSES REFERENCED TO LOCAL Y-Z COORDINATES
2. MID-SIDE STRESSES ARE NORMAL AND PARALLEL TO ELEMENT EDGES.

ELEMENT (	1)	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.23043D 03	-0.23060D 03	-0.23073D 03	-0.14497D 03	-0.23032D 03	-0.23032D 03	-0.23032D 03	-0.23070D 03	-4.07
1	L-1	-0.23039D 03	-0.24932D 03	-0.23039D 03	-0.12489D 04	-0.22423D 03	-0.22423D 03	-0.22423D 03	-0.23549D 03	-26.27
1	J-K	-0.22686D 03	-0.25336D 03	-0.23107D 03	0.50115D 03	-0.22601D 03	-0.22601D 03	-0.22601D 03	-0.25624D 03	9.68
1	I-J	-0.23905D 03	-0.24311D 03	-0.24511D 03	0.16817D 03	-0.24491D 03	-0.24491D 03	-0.24491D 03	-0.23923D 03	83.22
1	K-L	-0.24165D 03	-0.21477D 03	-0.21543D 03	0.48918D 02	-0.21476D 03	-0.21476D 03	-0.21476D 03	-0.24166D 03	88.96

ELEMENT (	2)	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.19388D 03	-0.24933D 03	-0.19487D 03	-0.44933D 03	-0.19352D 03	-0.19352D 03	-0.19352D 03	-0.24991D 03	-4.98
1	L-1	-0.19329D 03	-0.24937D 03	-0.19524D 03	-0.12932D 04	-0.19234D 03	-0.19234D 03	-0.19234D 03	-0.25250D 03	-12.76
1	J-K	-0.19177D 03	-0.24930D 03	-0.19442D 03	0.80092D 02	-0.19191D 03	-0.19191D 03	-0.19191D 03	-0.24971D 03	0.79
1	I-J	-0.26835D 03	-0.22378D 03	-0.22644D 03	0.34292D 03	-0.22351D 03	-0.22351D 03	-0.22351D 03	-0.26862D 03	85.42
1	K-L	-0.23020D 03	-0.15981D 03	-0.16164D 03	-0.19812D 03	-0.15976D 03	-0.15976D 03	-0.15976D 03	-0.23026D 03	-88.39

ELEMENT (	3)	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.13247D 03	-0.23009D 03	-0.13507D 03	-0.11422D 04	-0.13213D 03	-0.13213D 03	-0.13213D 03	-0.23142D 03	-6.63
1	L-1	-0.13274D 03	-0.22283D 03	-0.13271D 03	-0.1627D 03	-0.12977D 03	-0.12977D 03	-0.12977D 03	-0.23580D 03	-10.13
1	J-K	-0.13471D 03	-0.23750D 03	-0.13760D 03	-0.89876D 03	-0.13393D 03	-0.13393D 03	-0.13393D 03	-0.23828D 03	-4.96
1	I-J	-0.25163D 03	-0.16866D 03	-0.17048D 03	0.72428D 02	-0.16863D 03	-0.16863D 03	-0.16863D 03	-0.25164D 03	89.50
1	K-L	-0.20989D 03	-0.94570D 04	-0.98215D 04	-0.77368D 03	-0.94054D 04	-0.94054D 04	-0.94054D 04	-0.21041D 03	-86.18

ELEMENT (	4)	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.86730D 04	-0.21268D 03	-0.87736D 04	-0.14149D 04	-0.85160D 04	-0.85160D 04	-0.85160D 04	-0.21423D 03	-6.33
1	L-1	-0.82211D 04	-0.22233D 03	-0.92211D 04	-0.16709D 04	-0.90103D 04	-0.90103D 04	-0.90103D 04	-0.22444D 03	-7.19
1	J-K	-0.81166D 04	-0.20167D 03	-0.82896D 04	-0.13173D 04	-0.79743D 04	-0.79743D 04	-0.79743D 04	-0.20309D 03	-4.17
1	I-J	-0.22570D 03	-0.10111D 03	-0.10474D 03	-0.46477D 03	-0.10094D 03	-0.10094D 03	-0.10094D 03	-0.22587D 03	-87.87
1	K-L	-0.19345D 03	-0.77797D 04	-0.70259D 04	-0.34323D 04	-0.68378D 04	-0.68378D 04	-0.68378D 04	-0.20287D 03	-74.65

ELEMENT (	5)	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.33363D 04	-0.15577D 03	-0.33213D 04	-0.70383D 03	-0.32882D 04	-0.32882D 04	-0.32882D 04	-0.15623D 03	-3.91
1	L-1	-0.32482D 04	-0.15414D 03	-0.32482D 04	-0.66791D 03	-0.32044D 04	-0.32044D 04	-0.32044D 04	-0.15458D 03	-3.74
1	J-K	-0.34402D 04	-0.15743D 03	-0.34001D 04	-0.86173D 03	-0.33782D 04	-0.33782D 04	-0.33782D 04	-0.15905D 03	-4.42
1	I-J	-0.14714D 03	-0.38677D 04	-0.31133D 04	-0.27289D 04	-0.30936D 04	-0.30936D 04	-0.30936D 04	-0.15488D 03	-74.18
1	K-L	-0.14129D 03	-0.71198D 04	-0.55294D 04	-0.37622D 04	-0.54827D 04	-0.54827D 04	-0.54827D 04	-0.15766D 03	-66.48

ELEMENT (	6)	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.49373D 04	-0.11249D 03	-0.48126D 04	-0.39912D 03	-0.49122D 04	-0.49122D 04	-0.49122D 04	-0.11273D 03	-3.60
1	L-1	-0.45759D 04	-0.10799D 03	-0.45759D 04	-0.23543D 03	-0.45670D 04	-0.45670D 04	-0.45670D 04	-0.10808D 03	-3.16
1	J-K	-0.53238D 04	-0.11734D 03	-0.50676D 04	-0.57411D 03	-0.52748D 04	-0.52748D 04	-0.52748D 04	-0.11785D 03	-5.08
1	I-J	-0.87269D 04	-0.47660D 04	-0.33821D 04	-0.28394D 04	-0.34845D 04	-0.34845D 04	-0.34845D 04	-0.10488D 03	-62.45
1	K-L	-0.10724D 03	-0.77553D 04	-0.62429D 04	-0.25418D 04	-0.62962D 04	-0.62962D 04	-0.62962D 04	-0.12183D 03	-60.14



ANGLE

S-MIN

S-MAX

S12

S33

S22

S11

LOAD LOC

0.11  
-6.79  
5.90  
-60.57  
-48.30

-0.90007D 04  
-0.94315D 04  
-0.86249D 04  
-0.10336D 05  
-0.75259D 04

-0.71826D 04  
-0.77189D 04  
-0.66366D 04  
-0.96587D 04  
-0.45860D 04

0.33821D 01  
-0.20342D 03  
0.20314D 03  
-0.37533D 03  
-0.14603D 04

-0.69267D 04  
-0.72150D 04  
-0.66576D 04  
-0.94328D 04  
-0.43833D 04

-0.90007D 04  
-0.94273D 04  
-0.86040D 04  
-0.98705D 04  
-0.58870D 04

-0.71826D 04  
-0.77432D 04  
-0.66576D 04  
-0.10324D 05  
-0.62249D 04

1 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ANGLE  
-4.39  
-32.06  
-1.69  
71.34  
-78.58

S-MIN  
-0.24421D 05  
-0.27466D 05  
-0.22621D 05  
-0.25711D 05  
-0.23014D 05

S-MAX  
-0.22821D 05  
-0.23520D 05  
-0.20387D 05  
-0.24157D 05  
-0.20937D 05

S12  
-0.12202D 03  
-0.17752D 04  
-0.45731D 02  
-0.48928D 03  
-0.40277D 03

S33  
-0.22860D 05  
-0.23914D 05  
-0.21644D 05  
-0.24350D 05  
-0.21112D 05

S22  
-0.24411D 05  
-0.26354D 05  
-0.22619D 05  
-0.24323D 05  
-0.21021D 05

S11  
-0.22830D 05  
-0.24632D 05  
-0.20389D 05  
-0.25606D 05  
-0.22933D 05

ELEMENT ( 8 )  
LOAD LOC  
1 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ANGLE  
-5.67  
-17.19  
-2.47  
82.24  
-87.32

S-MIN  
-0.25116D 05  
-0.25835D 05  
-0.24600D 05  
-0.27179D 05  
-0.23001D 05

S-MAX  
-0.19238D 05  
-0.19271D 05  
-0.18894D 05  
-0.22656D 05  
-0.15647D 05

S12  
-0.57820D 03  
-0.18528D 04  
-0.24598D 03  
-0.60469D 03  
-0.34375D 03

S33  
-0.19548D 05  
-0.19711D 05  
-0.19328D 05  
-0.22829D 05  
-0.16125D 05

S22  
-0.25058D 05  
-0.25262D 05  
-0.24589D 05  
-0.22739D 05  
-0.15663D 05

S11  
-0.19296D 05  
-0.19847D 05  
-0.18904D 05  
-0.27096D 05  
-0.22985D 05

ELEMENT ( 9 )  
LOAD LOC  
1 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ANGLE  
-7.78  
-12.15  
-7.44  
85.80  
-83.56

S-MIN  
-0.23931D 05  
-0.24533D 05  
-0.23323D 05  
-0.26058D 05  
-0.21830D 05

S-MAX  
-0.13533D 05  
-0.13728D 05  
-0.13222D 05  
-0.16858D 05  
-0.10094D 05

S12  
-0.13971D 04  
-0.22242D 04  
-0.12965D 04  
-0.67047D 03  
-0.13084D 04

S33  
-0.13991D 05  
-0.14063D 05  
-0.13799D 05  
-0.17367D 05  
-0.10514D 05

S22  
-0.23760D 05  
-0.24054D 05  
-0.23154D 05  
-0.16908D 05  
-0.10242D 05

S11  
-0.13723D 05  
-0.14205D 05  
-0.13592D 05  
-0.25994D 05  
-0.21682D 05

ELEMENT ( 10 )  
LOAD LOC  
1 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ANGLE  
-9.64  
-11.40  
-9.60  
-89.25  
-77.35

S-MIN  
-0.20627D 05  
-0.21116D 05  
-0.20024D 05  
-0.21815D 05  
-0.19452D 05

S-MAX  
-0.85861D 04  
-0.87611D 04  
-0.83091D 04  
-0.10300D 05  
-0.68304D 04

S12  
-0.19882D 04  
-0.23947D 04  
-0.19257D 04  
-0.15082D 03  
-0.26978D 04

S33  
-0.68232D 04  
-0.87548D 04  
-0.87037D 04  
-0.10570D 05  
-0.70505D 04

S22  
-0.20289D 05  
-0.20633D 05  
-0.19698D 05  
-0.10302D 05  
-0.74361D 04

S11  
-0.89239D 04  
-0.92442D 04  
-0.82447D 04  
-0.21813D 05  
-0.18846D 05

ELEMENT ( 11 )  
LOAD LOC  
1 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ANGLE  
-9.36  
-10.01  
-9.06  
-80.23  
-68.68

S-MIN  
-0.16045D 05  
-0.16315D 05  
-0.15710D 05  
-0.16305D 05  
-0.15800D 05

S-MAX  
-0.56417D 04  
-0.57337D 04  
-0.54979D 04  
-0.59688D 04  
-0.53067D 04

S12  
-0.16689D 04  
-0.18108D 04  
-0.15873D 04  
-0.17293D 04  
-0.35539D 04

S33  
-0.56897D 04  
-0.56530D 04  
-0.57337D 04  
-0.58800D 04  
-0.55012D 04

S22  
-0.15770D 05  
-0.15996D 05  
-0.15457D 05  
-0.12667D 04  
-0.66938D 04

S11  
-0.59167D 04  
-0.50533D 04  
-0.57599D 04  
-0.16007D 05  
-0.14413D 05

ELEMENT ( 12 )  
LOAD LOC  
1 CEN  
1 L-I  
1 J-K  
1 I-J  
1 K-L

ANGLE  
-8.61  
-8.05  
-8.64  
-48.11

S-MIN  
-0.11773D 05  
-0.11659D 05  
-0.11936D 05  
-0.11193D 05

S-MAX  
-0.47457D 04  
-0.46773D 04  
-0.48578D 04  
-0.48241D 04

S12  
-0.10401D 04  
-0.96786D 03  
-0.10509D 04  
-0.56708D 04

S33  
-0.47793D 04  
-0.48564D 04  
-0.47933D 04  
-0.47733D 04

S22  
-0.11615D 05  
-0.11523D 05  
-0.11777D 05

S11  
-0.49032D 04  
-0.48141D 04

ELEMENT ( 13 )  
LOAD LOC  
1 CEN  
1 L-I

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE

1 CEN -0.6924D 04 -0.89503D 04 -0.63704D 04 -0.39929D 03 -0.65266D 04 -0.90161D 04 -9.36  
 1 L-1 -0.69728D 04 -0.91998D 04 -0.63808D 04 -0.54318D 03 -0.68474D 04 -0.93252D 04 -13.00  
 1 J-K -0.63206D 04 -0.88406D 04 -0.66283D 04 -0.21888D 03 -0.63017D 04 -0.88594D 04 -4.93  
 1 I-J -0.10075D 03 -0.90110D 04 -0.86564D 04 -0.72004D 03 -0.86478D 04 -0.10438D 05 -63.23  
 1 K-L -0.66034D 04 -0.52698D 04 -0.40350D 04 -0.15399D 04 -0.42585D 04 -0.76147D 04 -56.71

ELEMENT ( 15 )

LOAD LOC S11 S22 S33 S12 B-MAX B-MIN ANGLE  
 1 CEN -0.22498D 03 -0.24724D 03 -0.22840D 03 -0.11700D 02 -0.22497D 03 -0.24724D 03 -0.30  
 1 L-1 -0.28855D 03 -0.26140D 03 -0.25144D 03 -0.25492D 04 -0.24610D 03 -0.30386D 03 -59.02  
 1 J-K -0.17881D 03 -0.20561D 03 -0.20252D 03 -0.16665D 03 -0.17871D 03 -0.20572D 03 -3.54  
 1 I-J -0.27644D 03 -0.24792D 03 -0.25020D 03 -0.88927D 03 -0.24538D 03 -0.27899D 03 74.02  
 1 K-L -0.21369D 03 -0.19990D 03 -0.20385D 03 -0.10262D 04 -0.19443D 03 -0.21916D 03 -61.95

ELEMENT ( 16 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.18785D 03 -0.24790D 03 -0.19374D 03 -0.74298D 03 -0.18695D 03 -0.24880D 03 -6.93  
 1 L-1 -0.19619D 03 -0.24890D 03 -0.19625D 03 -0.22408D 04 -0.18795D 03 -0.25714D 03 -20.19  
 1 J-K -0.18393D 03 -0.24144D 03 -0.19095D 03 -0.57885D 03 -0.18335D 03 -0.24201D 03 -5.69  
 1 I-J -0.26886D 03 -0.22267D 03 -0.22661D 03 -0.79266D 03 -0.22135D 03 -0.27018D 03 80.53  
 1 K-L -0.22723D 03 -0.15144D 03 -0.15994D 03 -0.37829D 03 -0.15125D 03 -0.22741D 03 -87.15

ELEMENT ( 17 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.13514D 03 -0.23133D 03 -0.13968D 03 -0.22378D 04 -0.13019D 03 -0.23628D 03 -12.48  
 1 L-1 -0.14254D 03 -0.23512D 03 -0.14155D 03 -0.31723D 04 -0.13271D 03 -0.24495D 03 -17.21  
 1 J-K -0.13145D 03 -0.22212D 03 -0.13693D 03 -0.21071D 04 -0.12680D 03 -0.22687D 03 -12.45  
 1 I-J -0.25535D 03 -0.16310D 03 -0.17161D 03 -0.14939D 04 -0.16074D 03 -0.25771D 03 81.03  
 1 K-L -0.21471D 03 -0.99532D 04 -0.10730D 03 -0.81723D 03 -0.98955D 04 -0.21529D 03 -85.96

ELEMENT ( 18 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.92778D 04 -0.19511D 03 -0.90737D 04 -0.30426D 04 -0.84415D 04 -0.20347D 03 -15.37  
 1 L-1 -0.98354D 04 -0.20194D 03 -0.91988D 04 -0.35018D 04 -0.87627D 04 -0.21267D 03 -17.03  
 1 J-K -0.87772D 04 -0.18563D 03 -0.88164D 04 -0.27886D 03 -0.80383D 04 -0.19301D 03 -14.84  
 1 I-J -0.21698D 03 -0.10057D 03 -0.10826D 03 -0.97069D 03 -0.99764D 04 -0.21778D 03 85.27  
 1 K-L -0.18652D 03 -0.72120D 04 -0.73262D 04 -0.20333D 04 -0.68613D 04 -0.19002D 03 -80.22

ELEMENT ( 19 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.64393D 04 -0.15316D 03 -0.59637D 04 -0.25587D 04 -0.57546D 04 -0.16001D 03 -14.98  
 1 L-1 -0.67356D 04 -0.15864D 03 -0.60297D 04 -0.27386D 04 -0.59770D 04 -0.16622D 03 -15.48  
 1 J-K -0.60686D 04 -0.14760D 03 -0.57997D 04 -0.22263D 04 -0.54747D 04 -0.15293D 03 -13.48  
 1 I-J -0.16595D 03 -0.63678D 04 -0.64790D 04 -0.80228D 03 -0.63053D 04 -0.16657D 03 -85.54  
 1 K-L -0.14396D 03 -0.61976D 04 -0.54626D 04 -0.30624D 04 -0.51800D 04 -0.15414D 03 -71.62

ELEMENT ( 20 )

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE  
 1 CEN -0.64393D 04 -0.15316D 03 -0.59637D 04 -0.25587D 04 -0.57546D 04 -0.16001D 03 -14.98  
 1 L-1 -0.67356D 04 -0.15864D 03 -0.60297D 04 -0.27386D 04 -0.59770D 04 -0.16622D 03 -15.48  
 1 J-K -0.60686D 04 -0.14760D 03 -0.57997D 04 -0.22263D 04 -0.54747D 04 -0.15293D 03 -13.48  
 1 I-J -0.16595D 03 -0.63678D 04 -0.64790D 04 -0.80228D 03 -0.63053D 04 -0.16657D 03 -85.54  
 1 K-L -0.14396D 03 -0.61976D 04 -0.54626D 04 -0.30624D 04 -0.51800D 04 -0.15414D 03 -71.62



LOAD	LOC	S11	S22	S33	S12	J-MAX	S-MIN	ANGLE
1	CEN	-0.60398D 04	-0.87037D 04	-0.56951D 04	-0.94736D 03	-0.57554D 04	-0.90081D 04	-17.81
1	L-I	-0.51226D 04	-0.86228D 04	-0.5847D 04	-0.94634D 03	-0.58873D 04	-0.91279D 04	-17.87
1	J-K	-0.58861D 04	-0.97513D 04	-0.55326D 04	-0.80274D 03	-0.59663D 04	-0.89610D 04	-14.63
1	I-J	-0.76241D 04	-0.7289D 04	-0.75380D 04	-0.10262D 04	-0.72797D 04	-0.10073D 03	-66.38
1	K-L	-0.73055D 04	-0.47206D 04	-0.37808D 04	-0.13841D 04	-0.41193D 04	-0.79067D 04	-66.52
ELEMENT ( 22)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.21430D 03	-0.24681D 03	-0.22483D 03	-0.17674D 03	-0.21620D 03	-0.24691D 03	-3.30
1	L-I	-0.31130D 03	-0.26052D 03	-0.25723D 03	-0.29843D 04	-0.24673D 03	-0.32510D 03	-65.19
1	J-K	-0.15364D 03	-0.18292D 03	-0.18797D 03	-0.40224D 03	-0.15323D 03	-0.18350D 03	8.27
1	I-J	-0.29704D 03	-0.28578D 03	-0.25522D 03	0.14912D 04	-0.24553D 03	-0.30128D 03	74.14
1	K-L	-0.19201D 03	-0.18264D 03	-0.19208D 03	-0.12708D 04	-0.17378D 03	-0.20087D 03	-55.12
ELEMENT ( 23)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.17761D 03	-0.24264D 03	-0.18943D 03	-0.13347D 04	-0.17498D 03	-0.24527D 03	-11.16
1	L-I	-0.19982D 03	-0.24393D 03	-0.19341D 03	-0.29529D 04	-0.17683D 03	-0.25694D 03	-23.75
1	J-K	-0.17340D 03	-0.2189D 03	-0.18504D 03	-0.11323D 04	-0.17129D 03	-0.23401D 03	-10.58
1	I-J	-0.38487D 03	-0.21272D 03	-0.22213D 03	0.14152D 04	-0.20913D 03	-0.26846D 03	79.75
1	K-L	-0.22305D 03	-0.14010D 03	-0.15639D 03	-0.11060D 03	-0.14009D 03	-0.22307D 03	-89.24
ELEMENT ( 24)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.13023D 03	-0.21843D 03	-0.13682D 03	-0.33833D 04	-0.11875D 03	-0.22993D 03	-18.74
1	L-I	-0.13978D 03	-0.23568D 03	-0.14037D 03	-0.41853D 04	-0.12270D 03	-0.24270D 03	-22.13
1	J-K	-0.12426D 03	-0.20598D 03	-0.13239D 03	-0.20570D 04	-0.11403D 03	-0.21579D 03	-18.47
1	I-J	-0.28455D 03	-0.14908D 03	-0.16529D 03	0.26810D 04	-0.14206D 03	-0.25157D 03	79.59
1	K-L	-0.20769D 03	-0.95046D 04	-0.10848D 03	-0.82425D 02	-0.95040D 04	-0.20969D 03	-89.59
ELEMENT ( 25)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.94549D 04	-0.18043D 03	-0.91811D 04	-0.40837D 04	-0.79951D 04	-0.19702D 03	-22.12
1	L-I	-0.13020D 03	-0.19192D 03	-0.94434D 04	-0.44464D 04	-0.84598D 04	-0.21034D 03	-22.51
1	J-K	-0.87598D 04	-0.16912D 03	-0.87911D 04	-0.37093D 04	-0.74476D 04	-0.18213D 03	-20.34
1	I-J	-0.1024D 03	-0.95413D 04	-0.10873D 03	0.21976D 04	-0.91351D 04	-0.21431D 03	79.53
1	K-L	-0.18046D 03	-0.69122D 04	-0.75289D 04	-0.11687D 04	-0.67908D 04	-0.18167D 03	-84.07
ELEMENT ( 26)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.70814D 04	-0.14381D 03	-0.62336D 04	-0.33573D 04	-0.57721D 04	-0.15690D 03	-21.31
1	L-I	-0.7184D 04	-0.15340D 03	-0.6309D 04	-0.34818D 04	-0.61056D 04	-0.16653D 03	-20.46
1	J-K	-0.6549D 04	-0.13742D 03	-0.59827D 04	-0.27018D 04	-0.53738D 04	-0.14614D 03	-17.89
1	I-J	-0.1677D 03	-0.69551D 04	-0.70073D 04	0.20834D 03	-0.63910D 04	-0.16781D 03	88.83
1	K-L	-0.14137D 03	-0.57534D 04	-0.55000D 04	-0.23812D 03	-0.51056D 04	-0.14765D 03	-75.23
ELEMENT ( 27)								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.53361D 04	-0.11177D 03	-0.47384D 04	-0.24121D 04	-0.44688D 04	-0.12044D 03	-19.78
1	L-I	-0.54827D 04	-0.11763D 03	-0.46826D 04	-0.23732D 04	-0.46870D 04	-0.12561D 03	-18.54
1	J-K	-0.47277D 04	-0.10979D 03	-0.45396D 04	-0.18452D 04	-0.42237D 04	-0.11483D 03	-15.28

## ELEMENT ( 28)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.35928D 04	-0.82400D 04	-0.50420D 04	-0.16167D 04	-0.48270D 04	-0.90058D 04	-25.35
1	L-I	-0.53134D 04	-0.83121D 04	-0.48326D 04	-0.13964D 04	-0.47639D 04	-0.88616D 04	-21.48
1	J-K	-0.55378D 04	-0.85521D 04	-0.53144D 04	-0.15030D 04	-0.49165D 04	-0.91734D 04	-22.46
1	I-J	-0.50912D 04	-0.60503D 04	-0.62768D 04	-0.12550D 04	-0.5593D 04	-0.95422D 04	-70.23
1	K-L	-0.81860D 04	-0.42512D 04	-0.37404D 04	-0.10291D 04	-0.39983D 04	-0.84389D 04	-76.19

## ELEMENT ( 29)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.19681D 05	-0.24862D 05	-0.21793D 05	-0.51805D 03	-0.19629D 05	-0.24913D 05	-5.65
1	L-I	-0.33042D 05	-0.25520D 05	-0.26005D 05	-0.41439D 03	-0.23685D 05	-0.34877D 05	-46.11
1	J-K	-0.13464D 05	-0.14847D 05	-0.16948D 05	-0.45860D 03	-0.13326D 05	-0.14985D 05	-16.78
1	I-J	-0.32692D 05	-0.24019D 05	-0.25932D 05	-0.23039D 03	-0.23445D 05	-0.33266D 05	76.01
1	K-L	-0.17178D 05	-0.15626D 05	-0.17731D 05	-0.12897D 04	-0.14897D 05	-0.17907D 05	-60.52

## ELEMENT ( 30)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.16047D 05	-0.22893D 05	-0.18023D 05	-0.25975D 04	-0.15173D 05	-0.23767D 05	-18.60
1	L-I	-0.17574D 05	-0.23294D 05	-0.18603D 05	-0.39642D 04	-0.15546D 05	-0.25322D 05	-27.10
1	J-K	-0.11145D 05	-0.21334D 05	-0.17383D 05	-0.22008D 04	-0.14728D 05	-0.22068D 05	-18.42
1	I-J	-0.25103D 05	-0.18901D 05	-0.21002D 05	-0.27000D 04	-0.17890D 05	-0.26114D 05	69.48
1	K-L	-0.21576D 05	-0.12520D 05	-0.15090D 05	-0.71787D 03	-0.12463D 05	-0.21632D 05	85.50

## ELEMENT ( 31)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.12513D 05	-0.19347D 05	-0.13077D 05	-0.47988D 04	-0.10039D 05	-0.21821D 05	-27.27
1	L-I	-0.13538D 05	-0.21018D 05	-0.13698D 05	-0.52756D 04	-0.10811D 05	-0.23745D 05	-27.33
1	J-K	-0.11145D 05	-0.17713D 05	-0.12343D 05	-0.41168D 04	-0.91631D 04	-0.19695D 05	-25.71
1	I-J	-0.22358D 05	-0.12858D 05	-0.15417D 05	-0.44216D 04	-0.11119D 05	-0.24097D 05	68.52
1	K-L	-0.19727D 05	-0.89638D 04	-0.10797D 05	-0.95812D 03	-0.88791D 04	-0.19811D 05	84.95

## ELEMENT ( 32)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10152D 05	-0.15828D 05	-0.91843D 04	-0.49172D 04	-0.73128D 04	-0.18667D 05	-30.01
1	L-I	-0.10439D 05	-0.17690D 05	-0.95702D 04	-0.51163D 04	-0.79508D 04	-0.20378D 05	-27.71
1	J-K	-0.85179D 04	-0.14835D 05	-0.86699D 04	-0.40036D 04	-0.65769D 04	-0.16776D 05	-25.86
1	I-J	-0.19752D 05	-0.89900D 04	-0.10812D 05	-0.34568D 04	-0.79753D 04	-0.20766D 05	73.64
1	K-L	-0.16894D 05	-0.65516D 04	-0.76397D 04	-0.19762D 03	-0.65478D 04	-0.16898D 05	-88.91

## ELEMENT ( 33)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.78243D 04	-0.12977D 05	-0.65033D 04	-0.39596D 04	-0.56800D 04	-0.15121D 05	-28.46
1	L-I	-0.79950D 04	-0.14462D 05	-0.67036D 04	-0.39791D 04	-0.61012D 04	-0.16356D 05	-25.45
1	J-K	-0.44077D 05	-0.12540D 05	-0.61971D 04	-0.29935D 04	-0.51904D 04	-0.13759D 05	-22.16
1	I-J	-0.16467D 05	-0.63836D 04	-0.74660D 04	-0.12001D 04	-0.62427D 04	-0.16608D 05	83.1
1	K-L	-0.13646D 05	-0.53219D 04	-0.56162D 04	-0.15256D 04	-0.50511D 04	-0.13917D 05	-79.

## ELEMENT ( 34)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
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ELEMENT ( 33)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANG
1	CEN	-0.52315D 04	-0.73886D 04	-0.44959D 04	-0.23243D 04	-0.38185D 04	-0.90216D 04	-31.33
1	L-I	-0.43779D 04	-0.78124D 04	-0.43197D 04	-0.18194D 04	-0.35933D 04	-0.85970D 04	-23.33
1	J-K	-0.32140D 04	-0.82694D 04	-0.47911D 04	-0.23229D 04	-0.40445D 04	-0.94389D 04	-27.75
1	I-J	-0.86003D 04	-0.41827D 04	-0.50711D 04	-0.13423D 04	-0.38048D 04	-0.89762D 04	-74.36
1	K-L	-0.90668D 04	-0.36932D 04	-0.39018D 04	-0.53311D 03	-0.38388D 04	-0.91212D 04	-84.18

ELEMENT ( 36)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.15193D 03	-0.25401D 03	-0.20361D 03	-0.20154D 04	-0.14810D 03	-0.25785D 03	-10.77
1	L-I	-0.33963D 03	-0.23329D 03	-0.25411D 03	-0.69710D 04	-0.19879D 03	-0.37415D 03	-63.67
1	J-K	-0.12833D 03	-0.83499D 04	-0.14531D 03	-0.10217D 04	-0.81280D 03	-0.13055D 03	-77.75
1	I-J	-0.36215D 03	-0.19128D 03	-0.25191D 03	-0.40857D 04	-0.18201D 03	-0.37141D 03	-77.22
1	K-L	-0.17551D 03	-0.12209D 03	-0.16647D 03	-0.89752D 02	-0.12208D 03	-0.17553D 03	-89.04

ELEMENT ( 37)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.13692D 03	-0.18957D 03	-0.16182D 03	-0.50294D 04	-0.10648D 03	-0.22001D 03	-31.18
1	L-I	-0.15381D 03	-0.21305D 03	-0.17351D 03	-0.54828D 04	-0.12111D 03	-0.24575D 03	-30.81
1	J-K	-0.11532D 03	-0.16614D 03	-0.14873D 03	-0.44833D 04	-0.89198D 04	-0.19226D 03	-30.23
1	I-J	-0.20911D 03	-0.13484D 03	-0.17913D 03	-0.57441D 04	-0.10288D 03	-0.23807D 03	-60.91
1	K-L	-0.19715D 03	-0.11496D 03	-0.14456D 03	-0.25107D 04	-0.10789D 03	-0.20421D 03	-74.29

ELEMENT ( 38)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.12485D 03	-0.15182D 03	-0.12231D 03	-0.58679D 04	-0.78128D 04	-0.19854D 03	-38.53
1	L-I	-0.13144D 03	-0.18535D 03	-0.13167D 03	-0.60921D 04	-0.91790D 04	-0.22502D 03	-33.07
1	J-K	-0.74884D 04	-0.13742D 03	-0.11147D 03	-0.49648D 04	-0.62139D 04	-0.17016D 03	-33.41
1	I-J	-0.18921D 03	-0.11188D 03	-0.14134D 03	-0.64933D 04	-0.74970D 04	-0.22611D 03	-60.39
1	K-L	-0.17097D 03	-0.83522D 04	-0.10417D 03	-0.21176D 04	-0.78664D 04	-0.17583D 03	-77.08

ELEMENT ( 39)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10755D 03	-0.12999D 03	-0.91282D 04	-0.52149D 04	-0.65429D 04	-0.17211D 03	-38.93
1	L-I	-0.10724D 03	-0.15743D 03	-0.95790D 04	-0.53415D 04	-0.73318D 04	-0.19135D 03	-32.42
1	J-K	-0.80790D 04	-0.12679D 03	-0.64572D 04	-0.41481D 04	-0.56359D 04	-0.15122D 03	-30.50
1	I-J	-0.12847D 03	-0.86786D 04	-0.10731D 03	-0.44982D 04	-0.68402D 04	-0.19685D 03	-67.77
1	K-L	-0.15175D 03	-0.61710D 04	-0.78596D 04	-0.77422D 03	-0.81049D 04	-0.15241D 03	-85.12

ELEMENT ( 40)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.89971D 04	-0.11201D 03	-0.67743D 04	-0.42268D 04	-0.54761D 04	-0.14322D 03	-36.44
1	L-I	-0.83343D 04	-0.13330D 03	-0.69400D 04	-0.41859D 04	-0.59577D 04	-0.15707D 03	-29.59
1	J-K	-0.64246D 04	-0.11312D 03	-0.64572D 04	-0.30950D 04	-0.49248D 04	-0.12811D 03	-25.85
1	I-J	-0.15620D 03	-0.43637D 04	-0.78456D 04	-0.21040D 04	-0.59079D 04	-0.16076D 03	-77.78
1	K-L	-0.12915D 03	-0.50123D 04	-0.58163D 04	-0.58015D 03	-0.49700D 04	-0.12958D 03	-85.82

ELEMENT ( 41)

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.64371D 04	-0.93375D 04	-0.50485D 04	-0.33378D 04	-0.42481D 04	-0.11527D 03	-33.26
1	L-I	-0.48068D 04	-0.10931D 03	-0.52152D 04	-0.31744D 04	-0.45993D 04	-0.12522D 03	-26.63
1	J-K	-0.21806D 04	-0.43637D 04	-0.78456D 04	-0.21040D 04	-0.59079D 04	-0.16076D 03	-77.78
1	I-J	-0.15620D 03	-0.43637D 04	-0.78456D 04	-0.21040D 04	-0.59079D 04	-0.16076D 03	-77.78
1	K-L	-0.12915D 03	-0.50123D 04	-0.58163D 04	-0.58015D 03	-0.49700D 04	-0.12958D 03	-85.82

ELEMENT	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
ELEMENT ( 43 )	1	CEN	-0.51095D 04	-0.68277D 04	-0.41146D 04	-0.29334D 04	-0.28916D 04	-0.90476D 04	-36.89
	1	L-I	-0.34687D 04	-0.74878D 04	-0.38564D 04	-0.21041D 04	-0.25687D 04	-0.83878D 04	-23.16
	1	J-K	-0.48662D 04	-0.80104D 04	-0.44202D 04	-0.28347D 04	-0.31723D 04	-0.96843D 04	-50.52
	1	I-J	-0.82416D 04	-0.24336D 04	-0.40972D 04	-0.12350D 04	-0.21819D 04	-0.84733D 04	-78.48
	1	K-L	-0.97828D 04	-0.36933D 04	-0.42473D 04	0.23234D 02	-0.36932D 04	-0.97829D 04	89.78
ELEMENT ( 44 )	1	CEN	-0.79943D 04	-0.15177D 05	-0.15040D 05	-0.10981D 05	-0.32203D 02	-0.23139D 05	-35.94
	1	L-I	-0.35522D 05	-0.17766D 05	-0.23515D 05	-0.10439D 05	-0.15656D 05	-0.40356D 05	-55.17
	1	J-K	-0.92756D 04	-0.77936D 03	-0.57330D 05	-0.12587D 05	-0.18175D 05	-0.96785D 05	-34.42
	1	I-J	-0.40450D 05	-0.25659D 05	-0.13001D 05	-0.37389D 05	-0.43518D 05	-0.97299D 05	55.74
	1	K-L	-0.13789D 05	-0.10033D 05	-0.14819D 05	0.73524D 04	-0.42557D 04	-0.17546D 05	52.09
ELEMENT ( 44 )	1	CEN	-0.12916D 05	-0.10674D 05	-0.12671D 05	-0.68869D 04	-0.48174D 04	-0.18772D 05	-49.62
	1	L-I	-0.13866D 05	-0.17571D 05	-0.15837D 05	-0.98872D 04	-0.8903D 04	-0.22947D 05	-37.58
	1	J-K	-0.59377D 04	-0.89898D 04	-0.11354D 05	-0.70230D 04	-0.27683D 03	-0.14651D 05	-38.87
	1	I-J	-0.11371D 05	-0.90655D 04	-0.13824D 05	0.10391D 05	-0.43514D 03	-0.20871D 05	48.11
	1	K-L	-0.14572D 05	-0.10800D 05	-0.13138D 05	0.40719D 04	-0.81987D 04	-0.17174D 05	57.43
ELEMENT ( 45 )	1	CEN	-0.12908D 05	-0.10427D 05	-0.11475D 05	-0.53877D 04	-0.61389D 04	-0.17196D 05	-51.48
	1	L-I	-0.82067D 04	-0.14938D 05	-0.12345D 05	-0.38511D 04	-0.71399D 04	-0.19493D 05	-38.91
	1	J-K	-0.14942D 05	-0.10773D 05	-0.10474D 05	-0.49514D 04	-0.43763D 04	-0.14606D 05	-37.74
	1	I-J	-0.15438D 05	-0.10974D 05	-0.13556D 05	0.73154D 04	-0.53782D 04	-0.20538D 05	52.59
	1	K-L	-0.13578D 05	-0.76214D 04	-0.98238D 04	0.28605D 04	-0.64702D 04	-0.14729D 05	68.08
ELEMENT ( 46 )	1	CEN	-0.11178D 05	-0.99691D 04	-0.90332D 04	-0.47309D 04	-0.58041D 04	-0.13343D 05	-48.64
	1	L-I	-0.10311D 05	-0.13597D 05	-0.94732D 04	-0.3069D 04	-0.6654D 04	-0.1242D 05	-35.95
	1	J-K	-0.73672D 04	-0.10787D 05	-0.84898D 04	-0.3899D 04	-0.48188D 04	-0.13335D 05	-33.16
	1	I-J	-0.15438D 05	-0.84069D 04	-0.10592D 05	-0.49835D 04	-0.58536D 04	-0.18021D 05	62.60
	1	K-L	-0.13063D 05	-0.58961D 04	-0.76562D 04	0.14995D 04	-0.55950D 04	-0.15364D 05	78.65
ELEMENT ( 47 )	1	CEN	-0.92453D 04	-0.92756D 04	-0.70488D 04	-0.40411D 04	-0.52193D 04	-0.13302D 05	-44.89
	1	L-I	-0.83036D 04	-0.12083D 05	-0.72311D 04	-0.40618D 04	-0.5735D 04	-0.14573D 05	-32.53
	1	J-K	-0.42265D 04	-0.10266D 05	-0.67744D 04	-0.29641D 04	-0.46595D 04	-0.18333D 05	-27.86
	1	I-J	-0.14278D 05	-0.64077D 04	-0.81635D 04	0.27287D 03	-0.5542D 04	-0.15132D 05	72.63
	1	K-L	-0.11929D 05	-0.48279D 04	-0.60839D 04	0.29977D 03	-0.48152D 04	-0.11942D 05	87.59
ELEMENT ( 48 )	1	CEN	-0.71562D 04	-0.80979D 04	-0.53874D 04	-0.34191D 04	-0.41757D 04	-0.11078D 05	-41.08
	1	L-I	-0.63279D 04	-0.10269D 05	-0.54342D 04	-0.2143D 04	-0.45091D 04	-0.12108D 05	-29.29
	1	J-K	-0.47114D 04	-0.90636D 04	-0.52165D 04	-0.2195D 04	-0.3789D 04	-0.99751D 05	-22.59
	1	I-J	-0.12211D 05	-0.49480D 04	-0.62014D 04	0.11075D 03	-0.4828D 04	-0.13376D 05	81.52
	1	K-L	-0.12211D 05	-0.49480D 04	-0.62014D 04	0.11075D 03	-0.4828D 04	-0.10113D 05	-84.81

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.52182D 04	-0.60749D 04	-0.40691D 04	-0.33632D 04	-0.22562D 04	-0.90369D 04	-41.37
1	L-1	-0.27207D 04	-0.74364D 04	-0.38360D 04	-0.21026D 04	-0.19194D 04	-0.82377D 04	-20.86
1	J-K	-0.44640D 04	-0.78933D 04	-0.42673D 04	-0.31970D 04	-0.25547D 04	-0.98090D 04	-30.91
1	I-J	-0.80317D 04	-0.11742D 04	-0.35940D 04	-0.91087D 03	-0.10552D 04	-0.81507D 04	-82.56
1	K-L	-0.10172D 05	-0.36886D 04	-0.47427D 04	-0.54252D 03	-0.36436D 04	-0.10217D 05	-85.25
ELEMENT ( 50 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	0.13297D 04	0.11963D 05	-0.51354D 04	-0.48008D 04	0.13810D 05	-0.51705D 03	-68.96
1	L-1	0.90366D 04	-0.85400D 03	-0.58088D 04	-0.15468D 05	0.20343D 05	-0.12141D 05	-56.12
1	J-K	0.13330D 05	-0.23350D 04	-0.51356D 04	-0.87495D 03	0.13599D 05	0.24663D 04	-4.52
1	I-J	0.35841D 04	0.18320D 05	-0.28148D 04	-0.63789D 04	0.20858D 05	0.10785D 04	-69.15
1	K-L	-0.65094D 03	0.87383D 04	-0.64547D 04	-0.28572D 04	0.95394D 04	-0.14521D 04	-74.34
ELEMENT ( 51 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.70470D 04	0.12299D 03	-0.92227D 04	-0.49845D 04	0.27090D 04	-0.95937D 04	-65.94
1	L-1	-0.49978D 04	-0.86213D 04	-0.10702D 05	-0.91928D 04	0.28799D 04	-0.15899D 05	-39.13
1	J-K	-0.10095D 03	-0.21023D 04	-0.93210D 04	-0.38309D 04	0.28578D 04	-0.50610D 04	-37.68
1	I-J	-0.96779D 04	-0.50051D 04	-0.10181D 05	-0.63217D 04	0.73518D 04	-0.12025D 05	-69.63
1	K-L	-0.72715D 04	-0.68857D 03	-0.93650D 04	-0.21358D 04	-0.56362D 02	-0.79037D 04	-73.51
ELEMENT ( 52 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11169D 05	-0.58435D 04	-0.10884D 05	-0.31569D 04	-0.43763D 04	-0.12636D 05	-65.07
1	L-1	-0.12509D 05	-0.12546D 05	-0.12553D 05	-0.51008D 04	-0.64267D 04	-0.18628D 05	-44.91
1	J-K	-0.49723D 04	-0.67220D 04	-0.10107D 05	-0.23764D 04	-0.29073D 04	-0.82270D 04	-31.65
1	I-J	-0.18262D 05	-0.52410D 04	-0.13899D 05	-0.11651D 04	-0.31208D 04	-0.18366D 05	-84.93
1	K-L	-0.92506D 04	-0.35297D 04	-0.89557D 04	-0.82368D 03	-0.34134D 04	-0.93669D 04	-81.97
ELEMENT ( 53 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.11377D 05	-0.72971D 04	-0.94195D 04	-0.34297D 04	-0.53465D 04	-0.13327D 05	-60.37
1	L-1	-0.11222D 05	-0.12374D 05	-0.10079D 05	-0.51585D 04	-0.66075D 04	-0.16789D 05	-31.81
1	J-K	-0.41086D 04	-0.75333D 04	-0.86870D 04	-0.26869D 04	-0.40487D 04	-0.96133D 05	-37.48
1	I-J	-0.17596D 05	-0.69828D 04	-0.12041D 05	-0.74313D 03	-0.69279D 04	-0.17651D 05	-85.90
1	K-L	-0.95580D 04	-0.39532D 04	-0.70722D 04	-0.14146D 04	-0.36164D 04	-0.98948D 04	-76.61
ELEMENT ( 54 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.99372D 04	-0.79150D 04	-0.76309D 04	-0.33682D 04	-0.51468D 04	-0.12305D 05	-54.89
1	L-1	-0.89260D 04	-0.11378D 05	-0.78932D 04	-0.41228D 04	-0.58529D 04	-0.14454D 05	-56.73
1	J-K	-0.97560D 04	-0.91128D 04	-0.74067D 04	-0.39680D 04	-0.45112D 04	-0.10361D 05	-27.51
1	I-J	-0.14884D 05	-0.61561D 04	-0.92707D 04	-0.30310D 03	-0.61456D 04	-0.14895D 05	-88.01
1	K-L	-0.10336D 05	-0.43128D 04	-0.62708D 04	-0.96104D 03	-0.41632D 04	-0.10486D 05	-81.15
ELEMENT ( 55 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.79897D 04	-0.69190D 04	-0.59730D 04	-0.31581D 04	-0.42511D 04	-0.10658D 05	-49.81
1	L-1	-0.46565D 04	-0.98617D 04	-0.60175D 04	-0.32528D 04	-0.46329D 04	-0.11885D 05	-31.89
1	J-K	-0.47392D 04	-0.86778D 04	-0.59222D 04	-0.20108D 04	-0.38440D 04	-0.92230D 04	-22.80
1	I-J	-0.15130D 05	-0.50549D 04	-0.70114D 04	-0.19012D 03	-0.50478D 04	-0.12136D 05	-86.29



## ELEMENT ( 56 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.27248D 04	-0.55293D 04	-0.44048D 04	-0.33985D 04	-0.22382D 04	-0.90381D 04	-17
1	L-I	-0.25014D 04	-0.76732D 04	-0.43082D 04	-0.18058D 04	-0.19334D 04	-0.84230D 04	-27.91
1	L-J	-0.43133D 04	-0.80887D 04	-0.44916D 04	-0.31661D 04	-0.25151D 04	-0.98871D 04	-86.30
1	L-K	-0.74747D 04	-0.79145D 03	-0.35308D 04	-0.3804D 03	-0.7048D 03	-0.79957D 04	
1	K-L	-0.10409D 03	-0.39399D 04	-0.54711D 04	0.79312D 02	-0.39570D 04	-0.10410D 03	

## ELEMENT ( 57 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	0.79602D 03	0.36951D 04	-0.96180D 04	-0.49391D 02	0.36959D 04	0.79318D 03	-89.02
1	L-I	0.23709D 04	-0.20732D 04	-0.97401D 04	0.19744D 04	0.31260D 04	-0.28260D 04	20.84
1	L-J	0.47373D 04	-0.22638D 04	-0.99257D 04	0.33689D 03	0.48360D 04	-0.23207D 04	7.62
1	L-K	0.12483D 04	0.44235D 04	-0.93357D 04	0.17997D 03	0.4347D 04	0.13388D 04	87.88
1	K-L	0.36566D 03	0.30504D 04	-0.98684D 04	-0.10797D 03	0.30547D 04	0.36132D 03	-87.70

## ELEMENT ( 58 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	0.75103D 02	0.13913D 04	-0.96508D 04	-0.15030D 04	0.23759D 04	-0.90734D 03	-56.81
1	L-I	0.65703D 04	-0.65033D 03	-0.48032D 04	-0.38638D 03	0.65754D 04	-0.6204D 03	-3.73
1	L-J	-0.89116D 03	-0.24064D 04	-0.12192D 03	-0.15018D 04	0.3476D 02	-0.33265D 04	-31.44
1	L-K	0.13786D 04	0.34850D 04	-0.94515D 04	-0.2283D 04	0.4932D 04	-0.89236D 02	-57.27
1	K-L	-0.13716D 04	0.12040D 03	-0.96963D 04	-0.58333D 03	0.32139D 03	-0.13726D 04	-70.99

## ELEMENT ( 59 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.47626D 04	-0.27840D 04	-0.10271D 03	-0.15333D 04	-0.19469D 04	-0.5997D 04	-61.40
1	L-I	-0.20622D 04	-0.58033D 04	-0.91521D 04	-0.17410D 04	-0.13740D 04	-0.6481D 04	-21.47
1	L-J	-0.29828D 04	-0.42261D 04	-0.11357D 03	-0.98304D 03	-0.24415D 04	-0.4779D 04	-28.8
1	L-K	-0.59122D 04	-0.17588D 04	-0.11570D 03	-0.1409D 04	-0.1326D 04	-0.6354D 04	-7
1	K-L	-0.44741D 04	-0.29626D 04	-0.90777D 04	-0.98255D 03	-0.24788D 04	-0.49579D 04	-63

## ELEMENT ( 60 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.88308D 04	-0.54238D 04	-0.98957D 04	-0.13926D 04	-0.49270D 04	-0.93276D 04	-70.37
1	L-I	-0.95418D 04	-0.89732D 04	-0.10104D 04	-0.33115D 04	-0.59333D 04	-0.12581D 03	-47.46
1	L-J	-0.51421D 04	-0.62020D 04	-0.10038D 03	-0.12614D 04	-0.4303D 04	-0.70420D 04	-33.61
1	L-K	-0.12953D 03	-0.6460D 04	-0.12570D 03	-0.28529D 03	-0.4475D 04	-0.12964D 03	-87.49
1	K-L	-0.68316D 04	-0.35777D 04	-0.76989D 04	-0.51504D 03	-0.34681D 04	-0.69112D 04	-81.22

## ELEMENT ( 61 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.97094D 04	-0.60943D 04	-0.84411D 04	-0.20721D 04	-0.51523D 04	-0.10652D 03	-65.55
1	L-I	-0.85164D 04	-0.10250D 03	-0.85440D 04	-0.3425D 04	-0.5829D 04	-0.12914D 03	-37.89
1	L-J	-0.57100D 04	-0.79044D 04	-0.83948D 04	-0.18537D 04	-0.4578D 04	-0.8666D 04	-32.09
1	L-K	-0.13232D 03	-0.6222D 04	-0.10340D 03	0.6147D 03	-0.41691D 04	-0.13286D 03	85.03
1	K-L	-0.86613D 04	-0.41044D 04	-0.68067D 04	-0.2588D 03	-0.4088D 04	-0.86759D 04	-86.77

## ELEMENT ( 62 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
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ELEMENT ( 63)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	
1	CEN	-0.64044D 04	-0.53158D 04	-0.51192D 04	-0.30142D 04	-0.27972D 04	-0.89231D 04	-30.12	
1	L-I	-0.30398D 04	-0.78364D 04	-0.51965D 04	-0.14646D 04	-0.26278D 04	-0.82484D 04	-15.71	
1	J-K	-0.42393D 04	-0.83900D 04	-0.50282D 04	-0.26304D 04	-0.29641D 04	-0.9652D 04	-25.86	
1	I-J	-0.79448D 04	-0.14988D 04	-0.41274D 04	0.12258D 03	-0.14944D 04	-0.7471D 04	88.91	
1	K-L	-0.10157D 05	-0.42840D 04	-0.62856D 04	0.34109D 03	-0.42642D 04	-0.10176D 05	86.69	
ELEMENT ( 64)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	
1	CEN	-0.27714D 03	-0.58017D 03	-0.13441D 05	-0.27538D 03	-0.11434D 03	-0.74297D 03	-30.59	
1	L-I	-0.36734D 04	-0.12370D 04	-0.13461D 05	-0.14076D 04	-0.29343D 03	-0.43167D 04	-65.44	
1	J-K	-0.13141D 04	0.58114D 03	-0.13747D 05	-0.11479D 04	0.21527D 04	-0.25737D 03	-35.15	
1	I-J	-0.17480D 03	0.11210D 02	-0.13268D 05	-0.40317D 02	0.18458D 03	0.17250D 01	-13.18	
1	K-L	-0.77056D 03	-0.11348D 04	-0.13620D 05	-0.52565D 03	-0.39639D 03	-0.15090D 04	-35.44	
ELEMENT ( 65)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	
1	CEN	-0.48896D 03	-0.15410D 04	-0.12858D 05	-0.95875D 03	0.78522D 02	-0.21085D 04	-30.62	
1	L-I	-0.15713D 04	-0.13673D 04	-0.11172D 05	0.12337D 04	0.20207D 04	-0.18168D 04	20.01	
1	J-K	-0.18344D 04	-0.22009D 04	-0.14481D 05	0.38967D 03	-0.15871D 04	-0.24483D 04	32.41	
1	I-J	-0.49557D 03	-0.10221D 04	-0.13507D 05	-0.12180D 04	0.48725D 03	-0.20045D 04	-38.90	
1	K-L	-0.74316D 03	-0.17687D 04	-0.12268D 05	-0.86763D 03	-0.24810D 03	-0.22638D 04	-29.71	
ELEMENT ( 66)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	
1	CEN	-0.14185D 04	-0.30677D 04	-0.11560D 05	-0.12542D 04	-0.74209D 03	-0.37441D 04	-28.34	
1	L-I	-0.17246D 04	-0.22720D 04	-0.94117D 04	0.13073D 04	0.21143D 04	-0.26616D 04	16.80	
1	J-K	-0.31394D 04	-0.47819D 04	-0.13530D 05	0.21990D 03	-0.31105D 04	-0.48108D 04	7.50	
1	I-J	-0.96396D 03	-0.18631D 04	-0.12361D 05	-0.20260D 04	0.66180D 03	-0.34888D 04	-38.74	
1	K-L	-0.25521D 04	-0.34190D 04	-0.10823D 05	-0.94524D 03	-0.19457D 04	-0.40254D 04	-32.68	
ELEMENT ( 67)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	
1	CEN	-0.48533D 04	-0.49580D 04	-0.10541D 05	-0.83412D 03	-0.40700D 04	-0.57412D 04	-43.21	
1	L-I	-0.33529D 04	-0.54619D 04	-0.92998D 05	-0.14084D 03	-0.33435D 04	-0.54712D 04	-3.80	
1	J-K	-0.47403D 04	-0.60242D 04	-0.11724D 05	-0.11367D 03	-0.47303D 04	-0.60341D 04	-5.02	
1	I-J	-0.5654D 04	-0.47050D 04	-0.12108D 05	-0.94397D 03	-0.41261D 04	-0.62443D 04	-58.48	
1	K-L	-0.49342D 04	-0.43692D 04	-0.91419D 04	-0.58977D 03	-0.39976D 04	-0.53059D 04	-57.79	
ELEMENT ( 68)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	
1	CEN	-0.77848D 04	-0.56747D 04	-0.92484D 04	-0.93453D 03	-0.53203D 04	-0.81332D 04	-69.23	
1	L-I	-0.6624D 04	-0.78846D 04	-0.87733D 04	-0.16897D 04	-0.54495D 04	-0.90574D 04	-34.76	
1	J-K	-0.57409D 04	-0.68490D 04	-0.97260D 04	-0.90733D 03	-0.52317D 04	-0.73583D 04	-29.30	
1	I-J	-0.97072D 04	-0.63388D 04	-0.11111D 05	0.35733D 03	-0.45013D 04	-0.97447D 04	84.01	
1	K-L	-0.68460D 04	-0.43548D 04	-0.76172D 04	-0.89767D 02	-0.43516D 04	-0.68513D 04	-87.94	
ELEMENT ( 69)									
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE	

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.69213D 04	-0.54847D 04	-0.60533D 04	-0.23741D 04	-0.37226D 04	-0.86833D 04	-73.42
1	L-I	-0.39518D 04	-0.79090D 04	-0.62637D 04	-0.11397D 04	-0.35577D 04	-0.82011D 04	-14.69
1	J-K	-0.49440D 04	-0.84595D 04	-0.58177D 04	-0.18804D 04	-0.35720D 04	-0.92163D 04	-21.92
1	I-J	-0.78533D 04	-0.27978D 04	-0.50677D 04	0.38930D 03	-0.27680D 04	-0.78851D 04	85.62
1	K-L	-0.96381D 04	-0.47963D 04	-0.71886D 04	0.40624D 03	-0.47624D 04	-0.96720D 04	85.24

ELEMENT ( 71 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.40582D 03	-0.37064D 04	-0.16767D 05	-0.24633D 03	-0.38753D 03	-0.37247D 04	-4.24
1	L-I	-0.15534D 04	-0.15917D 05	-0.1761D 05	-0.78352D 03	-0.13084D 04	-0.40594D 04	-72.64
1	J-K	-0.29964D 04	-0.37095D 03	-0.17031D 05	-0.16069D 04	-0.39123D 03	-0.37586D 04	-64.62
1	I-J	-0.37154D 03	-0.36151D 04	-0.17031D 05	-0.15333D 03	-0.36429D 03	-0.36223D 04	-2.70
1	K-L	-0.47570D 03	-0.37902D 04	-0.16522D 05	-0.43900D 03	-0.41854D 03	-0.38474D 04	-7.42

ELEMENT ( 72 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.10216D 04	-0.39203D 04	-0.15740D 05	-0.77340D 03	-0.82721D 03	-0.41147D 04	-14.07
1	L-I	-0.19418D 04	-0.22380D 04	-0.14523D 05	0.17000D 04	-0.38350D 03	-0.37963D 04	42.51
1	J-K	-0.26133D 04	-0.26133D 04	-0.16937D 05	0.15876D 04	-0.12633D 04	-0.44802D 04	49.62
1	I-J	-0.15558D 04	-0.42325D 04	-0.16968D 05	-0.86896D 03	-0.12998D 04	-0.44936D 04	-16.48
1	K-L	-0.73290D 03	-0.34331D 04	-0.14608D 05	-0.10166D 04	-0.35324D 03	-0.37758D 04	-18.47

ELEMENT ( 73 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.19221D 04	-0.44039D 04	-0.13869D 05	-0.13698D 04	-0.13147D 04	-0.50113D 04	-23.91
1	L-I	-0.34172D 03	-0.36930D 04	-0.12856D 05	0.17038D 04	-0.20163D 03	-0.44423D 04	23.58
1	J-K	-0.31776D 04	-0.3080D 04	-0.15197D 05	0.1109D 04	-0.2567D 04	-0.35484D 04	25.10
1	I-J	-0.23294D 04	-0.40567D 04	-0.1367D 05	-0.18382D 04	-0.17733D 04	-0.32527D 04	-32.16
1	K-L	-0.23336D 04	-0.39930D 04	-0.12644D 05	-0.14718D 04	-0.14759D 04	-0.48549D 04	-30.30

ELEMENT ( 74 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.34389D 04	-0.53198D 04	-0.11834D 05	-0.12360D 04	-0.28262D 04	-0.59324D 04	-26.37
1	L-I	-0.17493D 04	-0.47805D 04	-0.10487D 05	0.12370D 04	-0.13149D 04	-0.52149D 04	19.50
1	J-K	-0.42922D 04	-0.64596D 04	-0.13117D 05	0.60389D 03	-0.41533D 04	-0.66163D 04	14.56
1	I-J	-0.38113D 04	-0.46060D 04	-0.13233D 05	-0.18909D 04	-0.22763D 04	-0.61409D 04	-39.07
1	K-L	-0.43501D 04	-0.48271D 04	-0.10664D 05	-0.11940D 04	-0.33710D 04	-0.58062D 04	-39.35

ELEMENT ( 75 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.59335D 04	-0.58997D 04	-0.10145D 05	-0.82769D 03	-0.50887D 04	-0.67449D 04	-45.59
1	L-I	-0.46925D 04	-0.64145D 04	-0.92930D 04	-0.12187D 03	-0.48639D 04	-0.54230D 04	-4.03
1	J-K	-0.54695D 04	-0.70440D 04	-0.10944D 05	-0.10017D 03	-0.5631D 04	-0.70303D 04	-3.63
1	I-J	-0.69787D 04	-0.59115D 04	-0.11748D 05	-0.72877D 03	-0.55419D 04	-0.73483D 04	-63.10
1	K-L	-0.60582D 04	-0.48806D 04	-0.87649D 04	-0.47912D 03	-0.47103D 04	-0.62285D 04	-70.43

ELEMENT ( 76 )								
LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.74830D 04	-0.58389D 04	-0.85446D 04	-0.11241D 04	-0.52683D 04	-0.80525D 04	-63.09
1	L-I	-0.57591D 04	-0.77436D 04	-0.80843D 04	-0.11916D 04	-0.52007D 04	-0.83020D 04	-25.11
1	J-K	-0.75406D 04	-0.75406D 04	-0.89752D 04	-0.81951D 03	-0.53377D 04	-0.78428D 04	-20.32
1	I-J	-0.89560D 04	-0.60783D 04	-0.99668D 04	0.17177D 03	-0.40481D 04	-0.89443D 04	84.20



AD-A142 210

DEVELOPMENT OF A DISTRIBUTED BREACH FOR THE CONICAL  
SHOCK TUBE(U) UNIVERSITY OF CENTRAL FLORIDA ORLANDO  
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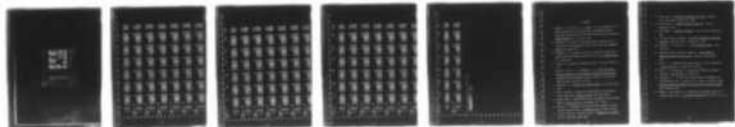
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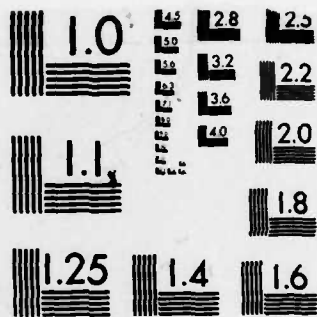


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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

ELEMENT ( 78 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.71217D 04	-0.59313D 04	-0.70007D 04	-0.17769D 04	-0.46325D 04	-0.84005D 04	-54.26		
1 L-I	-0.48367D 04	-0.79800D 04	-0.72871D 04	-0.74966D 03	-0.4672D 04	-0.81496D 04	-12.75		
1 J-K	-0.49817D 04	-0.83376D 04	-0.66871D 04	-0.1267D 04	-0.46385D 04	-0.86807D 04	-16.94		
1 I-J	-0.77959D 04	-0.41143D 04	-0.60849D 04	0.37087D 03	-0.40776D 04	-0.78329D 04	84.30		
1 K-L	-0.90713D 04	-0.52887D 04	-0.80611D 04	0.21084D 03	-0.52761D 04	-0.90839D 04	86.70		

ELEMENT ( 79 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.55207D 03	-0.63536D 04	-0.20282D 05	-0.27364D 03	-0.53919D 03	-0.63665D 04	-2.69		
1 L-I	-0.52007D 04	-0.12833D 03	-0.18671D 05	-0.17901D 04	-0.58852D 03	-0.58955D 04	-68.79		
1 J-K	-0.68801D 04	-0.64039D 03	-0.21444D 05	-0.28823D 03	-0.63710D 03	-0.68934D 04	-87.36		
1 I-J	-0.84382D 03	-0.64864D 04	-0.20999D 05	-0.28855D 03	-0.83326D 03	-0.66961D 04	-2.43		
1 K-L	-0.28975D 03	-0.60151D 04	-0.19595D 05	-0.43287D 03	-0.23720D 03	-0.60476D 04	-4.30		

ELEMENT ( 79 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.19141D 04	-0.99930D 04	-0.18637D 05	-0.48050D 03	-0.14130D 04	-0.60941D 04	-8.45		
1 L-I	-0.43423D 04	-0.31146D 04	-0.19533D 05	-0.19344D 04	-0.16990D 04	-0.57579D 04	53.80		
1 J-K	-0.41031D 04	-0.36098D 04	-0.19851D 05	-0.29990D 04	-0.12457D 04	-0.64671D 04	47.71		
1 I-J	-0.24759D 04	-0.69169D 04	-0.20497D 05	-0.68132D 03	-0.23737D 04	-0.70191D 04	-8.53		
1 K-L	-0.74884D 03	-0.49648D 04	-0.16925D 05	-0.10881D 04	-0.50328D 03	-0.52302D 04	-13.71		

ELEMENT ( 80 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.28987D 04	-0.56325D 04	-0.16113D 05	-0.12052D 04	-0.24082D 04	-0.60830D 04	-20.50		
1 L-I	-0.28576D 04	-0.48941D 04	-0.15065D 05	-0.15520D 04	-0.20196D 04	-0.57321D 04	28.37		
1 J-K	-0.37091D 04	-0.55198D 04	-0.17137D 05	-0.15818D 04	-0.27918D 04	-0.64371D 04	30.11		
1 I-J	-0.39239D 04	-0.62669D 04	-0.18227D 05	-0.13881D 04	-0.32790D 04	-0.69118D 04	-24.92		
1 K-L	-0.24993D 04	-0.45007D 04	-0.14522D 05	-0.15664D 04	-0.16413D 04	-0.53588D 04	-28.71		

ELEMENT ( 81 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.40129D 04	-0.57637D 04	-0.13449D 05	-0.14147D 04	-0.32247D 04	-0.65919D 04	-29.13		
1 L-I	-0.26575D 04	-0.57788D 04	-0.12443D 05	-0.11420D 04	-0.22843D 04	-0.61520D 04	18.10		
1 J-K	-0.42820D 04	-0.67183D 04	-0.14394D 05	-0.73640D 03	-0.40662D 04	-0.69340D 04	15.92		
1 I-J	-0.48289D 04	-0.54634D 04	-0.15213D 05	-0.18461D 04	-0.32729D 04	-0.70193D 04	-40.13		
1 K-L	-0.45472D 04	-0.49292D 04	-0.11972D 05	-0.14603D 04	-0.32655D 04	-0.62109D 04	-41.27		

ELEMENT ( 82 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.54417D 04	-0.61460D 04	-0.11833D 05	-0.10961D 04	-0.46425D 04	-0.69451D 04	-36.09		
1 L-I	-0.41042D 04	-0.64759D 04	-0.10380D 05	-0.46177D 03	-0.40175D 04	-0.65627D 04	10.44		
1 J-K	-0.52195D 04	-0.72932D 04	-0.11931D 05	-0.20821D 03	-0.51949D 04	-0.73139D 04	5.67		
1 I-J	-0.63588D 04	-0.5649D 04	-0.12717D 05	-0.13295D 03	-0.46419D 04	-0.73859D 04	-52.15		
1 K-L	-0.60877D 04	-0.52411D 04	-0.95107D 04	-0.84122D 03	-0.47227D 04	-0.66061D 04	-58.36		

ELEMENT ( 83 )	LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1 CEN	-0.68266D 04	-0.62189D 04	-0.93652D 04	-0.10320D 04	-0.54560D 04	-0.76152D 04	-53.54		
1 L-I	-0.53653D 04	-0.74256D 04	-0.88636D 04	-0.42988D 03	-0.52765D 04	-0.75116D 04	-11.31		
1 J-K	-0.56815D 04	-0.76503D 04	-0.98342D 04	-0.33903D 03	-0.56251D 04	-0.77168D 04	-9.46		
1 I-J	-0.81181D 04	-0.60801D 04	-0.10749D 05	-0.42945D 03	-0.59933D 04	-0.82049D 04	-78.57		
1 K-L	-0.71051D 04	-0.50114D 04	-0.81932D 04	-0.14644D 03	-0.50012D 04	-0.71163D 04	-86.02		

ELEMENT ( 84 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.71275D 04	-0.64240D 04	-0.78333D 04	-0.13884D 04	-0.52435D 04	-0.82080D 04	-52.11
1	L-1	-0.54714D 04	-0.80557D 04	-0.81312D 04	-0.42477D 03	-0.54035D 04	-0.81237D 04	-9.10
1	J-K	-0.53801D 04	-0.82065D 04	-0.75119D 04	-0.53934D 03	-0.52807D 04	-0.83060D 04	-10.44
1	I-J	-0.78119D 04	-0.50886D 04	-0.69826D 04	-0.20908D 03	-0.50727D 04	-0.78279D 04	85.64
1	K-L	-0.84658D 04	-0.56596D 04	-0.88378D 04	-0.68001D 02	-0.56581D 04	-0.86673D 04	-88.71

ELEMENT ( 85 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.27285D 03	-0.82598D 04	-0.24588D 05	-0.28468D 03	-0.26272D 03	-0.82700D 04	-2.04
1	L-1	-0.77599D 04	-0.10012D 04	-0.22305D 05	-0.76086D 03	-0.91654D 03	-0.78403D 04	-83.65
1	J-K	-0.43910D 04	-0.23113D 04	-0.26977D 05	-0.41609D 04	-0.28281D 03	-0.89851D 04	58.06
1	I-J	-0.37360D 03	-0.91438D 04	-0.25962D 05	-0.19353D 03	-0.96901D 03	-0.91484D 04	-1.36
1	K-L	-0.39762D 03	-0.73588D 04	-0.23265D 05	-0.53441D 03	-0.43426D 03	-0.73955D 04	-3.92

ELEMENT ( 86 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.18866D 04	-0.73350D 04	-0.22062D 05	-0.42786D 03	-0.18532D 04	-0.73684D 04	-4.46
1	L-1	-0.41933D 04	-0.44828D 04	-0.20716D 05	-0.17871D 04	-0.33569D 04	-0.73192D 04	57.79
1	J-K	-0.40200D 04	-0.41832D 04	-0.23505D 05	-0.34724D 04	-0.61907D 03	-0.75643D 04	44.29
1	I-J	-0.35713D 04	-0.89956D 04	-0.24902D 05	-0.24765D 03	-0.35600D 04	-0.90068D 04	-2.41
1	K-L	-0.39077D 03	-0.56271D 04	-0.19447D 05	-0.10589D 04	-0.18476D 03	-0.58331D 04	-11.01

ELEMENT ( 87 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.37480D 04	-0.63628D 04	-0.18549D 05	-0.75552D 03	-0.35454D 04	-0.65654D 04	-15.01
1	L-1	-0.48644D 04	-0.60021D 04	-0.17415D 05	-0.98594D 03	-0.42949D 04	-0.65715D 04	30.01
1	J-K	-0.41823D 04	-0.53917D 04	-0.19515D 05	-0.17552D 04	-0.29304D 04	-0.66435D 04	35.90
1	I-J	-0.55676D 04	-0.77619D 04	-0.21582D 05	-0.68201D 03	-0.53739D 04	-0.79566D 04	-15.93
1	K-L	-0.24425D 04	-0.47246D 04	-0.15872D 05	-0.13185D 04	-0.18397D 04	-0.53272D 04	-24.58

ELEMENT ( 88 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.49891D 04	-0.59652D 04	-0.15097D 05	-0.10475D 04	-0.42216D 04	-0.66328D 04	-32.51
1	L-1	-0.42188D 04	-0.69222D 04	-0.14368D 05	-0.48902D 03	-0.41236D 04	-0.67894D 04	10.79
1	J-K	-0.47007D 04	-0.63543D 04	-0.15813D 05	-0.60105D 03	-0.45059D 04	-0.65491D 04	17.99
1	I-J	-0.63690D 04	-0.63445D 04	-0.17492D 05	-0.11305D 03	-0.52262D 04	-0.74874D 04	-45.31
1	K-L	-0.45917D 04	-0.49148D 04	-0.13078D 05	-0.12068D 04	-0.35357D 04	-0.59709D 04	-41.19

ELEMENT ( 89 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.58472D 04	-0.62281D 04	-0.12285D 05	-0.10509D 04	-0.49698D 04	-0.71037D 04	-39.86
1	L-1	-0.46134D 04	-0.70427D 04	-0.11682D 05	-0.29103D 03	-0.45795D 04	-0.70771D 04	6.74
1	J-K	-0.53367D 04	-0.71411D 04	-0.12857D 05	-0.12766D 03	-0.53277D 04	-0.71501D 04	4.03
1	I-J	-0.49148D 04	-0.58745D 04	-0.14036D 05	-0.11351D 04	-0.51461D 04	-0.76432D 04	-57.51
1	K-L	-0.61712D 04	-0.54488D 04	-0.10856D 05	-0.84145D 03	-0.48943D 04	-0.67257D 04	-56.62

ELEMENT ( 90 )

LOAD	LOC	S11	S22	S33	S12	S-MAX	S-MIN	ANGLE
1	CEN	-0.66906D 04	-0.65177D 04	-0.10149D 05	-0.10119D 04	-0.53865D 04	-0.76197D 04	-47.44
1	L-1	-0.54125D 04	-0.75484D 04	-0.97230D 05	-0.83965D 02	-0.54095D 04	-0.75517D 04	-2.25
1	J-K	-0.57625D 04	-0.76831D 04	-0.10549D 05	-0.11468D 03	-0.57557D 04	-0.76900D 04	-3.41
1	I-J	-0.78210D 04	-0.61727D 04	-0.11578D 05	-0.67479D 03	-0.59426D 04	-0.81511D 04	-71.17

LOAD LOC S11 S22 S33 S12 S-MAX S-MIN ANGLE

1 CEN -0.71122D 04 -0.68080D 04 -0.83184D 04 -0.11708D 04 -0.57794D 04 -0.81407D 04 -48.70  
 1 L-I -0.56723D 04 -0.81030D 04 -0.87870D 04 -0.18693D 03 -0.56549D 04 -0.81206D 04 -5.06  
 1 J-K -0.57116D 04 -0.81599D 04 -0.82310D 04 -0.19090D 03 -0.56794D 04 -0.81691D 04 -4.19  
 1 I-J -0.78506D 04 -0.56762D 04 -0.76830D 04 -0.47992D 02 -0.56751D 04 -0.78517D 04 -88.74  
 1 K-L -0.84747D 04 -0.59700D 04 -0.95286D 04 -0.28688D 03 -0.59376D 04 -0.85071D 04 -83.55

ELEMENT ( 92 )

1 CEN -0.70713D 03 -0.70927D 04 -0.31060D 03 -0.34031D 03 -0.48686D 03 -0.71129D 04 3.22  
 1 L-I -0.19977D 04 -0.83124D 04 -0.33150D 03 -0.50650D 03 -0.19534D 04 -0.83567D 04 4.77  
 1 J-K -0.56413D 03 -0.59040D 04 -0.28812D 03 -0.48850D 02 -0.59061D 04 -0.59061D 04 0.61  
 1 I-J -0.37733D 04 -0.39681D 04 -0.35371D 03 -0.41909D 04 -0.32121D 03 -0.80628D 04 44.34  
 1 K-L -0.62596D 04 -0.22777D 04 -0.26929D 03 -0.10076D 04 -0.20372D 04 -0.65001D 04 76.58

ELEMENT ( 93 )

1 CEN -0.23940D 04 -0.61759D 04 -0.26856D 03 -0.6389D 03 -0.22874D 04 -0.62825D 04 9.40  
 1 L-I -0.50617D 04 -0.82233D 04 -0.31133D 03 -0.94837D 03 -0.47992D 04 -0.84878D 04 15.47  
 1 J-K -0.21278D 03 -0.43234D 04 -0.21203D 02 -0.21203D 02 -0.21288D 03 -0.43235D 04 0.27  
 1 I-J -0.37428D 04 -0.23148D 04 -0.29310 03 -0.31334D 04 -0.18494D 03 -0.62425D 04 51.42  
 1 K-L -0.65733D 04 -0.52622D 04 -0.24570D 03 -0.34768D 03 -0.51757D 04 -0.66598D 04 76.03

ELEMENT ( 94 )

1 CEN -0.41911D 04 -0.54624D 04 -0.21359D 03 -0.48280D 03 -0.38939D 04 -0.57596D 04 23.52  
 1 L-I -0.72134D 04 -0.73850D 04 -0.26036D 03 -0.10506D 04 -0.62450D 04 -0.83533D 04 42.67  
 1 J-K -0.11942D 04 -0.39164D 04 -0.17636D 03 -0.22530D 02 -0.11940D 04 -0.39164D 04 -0.47  
 1 I-J -0.43836D 04 -0.23059D 04 -0.22630D 03 -0.14631D 02 -0.13069D 04 -0.52826D 04 -0.61  
 1 K-L -0.68380D 04 -0.65004D 04 -0.20614D 03 -0.54616D 03 -0.60973D 04 -0.72408D 04 -53.59

ELEMENT ( 95 )

1 CEN -0.59590D 04 -0.52551D 04 -0.16325D 03 -0.19448D 03 -0.53775D 04 -0.57725D 04 47.90  
 1 L-I -0.74019D 04 -0.65827D 04 -0.20402D 03 -0.23202D 03 -0.64891D 04 -0.80934D 04 69.69  
 1 J-K -0.34255D 04 -0.47039D 04 -0.13720D 03 -0.25217D 03 -0.53682D 04 -0.47613D 04 -71.90  
 1 I-J -0.52570D 04 -0.39660D 04 -0.17040D 03 -0.47588D 03 -0.37764D 04 -0.54263D 04 -71.19  
 1 K-L -0.63707D 04 -0.70505D 04 -0.16504D 03 -0.58736D 03 -0.60320D 04 -0.73892D 04 -29.97

ELEMENT ( 96 )

1 CEN -0.63544D 04 -0.61920D 04 -0.13440D 03 -0.45889D 03 -0.58062D 04 -0.67402D 04 -70.01  
 1 L-I -0.78325D 04 -0.65272D 04 -0.15791D 03 -0.28677D 03 -0.64848D 04 -0.78748D 04 -79.94  
 1 J-K -0.59639D 04 -0.59081D 04 -0.11496D 03 -0.54479D 03 -0.49905D 04 -0.60815D 04 -46.47  
 1 I-J -0.57966D 04 -0.61995D 04 -0.13811D 03 -0.34654D 02 -0.57877D 04 -0.62024D 04 -4.81  
 1 K-L -0.58550D 04 -0.73570D 04 -0.13071D 03 -0.19603D 03 -0.58298D 04 -0.73822D 04 -7.31

ELEMENT ( 97 )

1 CEN -0.68050D 04 -0.67866D 04 -0.10448D 03 -0.80677D 03 -0.60282D 04 -0.76448D 04 -46.77  
 1 L-I -0.80624D 04 -0.69428D 04 -0.12528D 03 -0.54131D 03 -0.63550D 04 -0.82350D 04 -72.27  
 1 J-K -0.76666D 04 -0.59140D 04 -0.96613D 04 -0.42922D 03 -0.57757D 04 -0.72072D 04 -71.89





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